A WINDOW OPEN ON THE WORLD

The UNESCO Courier

UNIVERSITY OF MINNESOTA
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BIRTH OF AN ISLAND

JANUARY
1959
(12th year)

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'LE BOURGEOIS GENTILHOMME' on the Screen. Millions of persons who have never had an opportunity to see a play at Paris's world-famous Comédie Française will soon be able to see one in their local cinema. For the first time, the troupe of the Comédie Française has consented to have the entire performance of a play specially filmed for the screen. The play chosen was Moliere's " Le Bourgeois Gentilhomme". Its premiere showing took place in Paris a few weeks ago as part of "UNESCO Month," a series of cultural manifestations arranged by the French National Commission for UNESCO on the occasion of the inauguration of UNESCO's permanent headquarters and the Organization's tenth General Conference (See page 26). Photo from the film shows famous scene in which Monsieur Jourdain (right) learns to his surprise and delight that he speaks "prose".

U of M Bindery

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No. 1

12TH YEAR

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Editorial Offices
Unesco, Place de Fontenoy, Paris 7e, France

Editor-in-Chief
Sandy Koffler

Associate Editors
English Edition : Ronald Fenton
French Edition : Alexandre Leventis
Spanish Edition : Jorge Carrera Andrade
Russian Edition : Veniamin Matchavariani

Layout & Design
Robert Jacquemin

Sales & Distribution Offices
Unesco, Place de Fontenoy, Paris 7e

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COVER PHOTO

Submarine volcanoes are often responsible for the appearance of new islands though few remain above the waves for more than several months. Photographs show two stages in the development of one of these "disappearing islands" which pushed its way up from the sea floor in 1956 some 200 miles south of Tokyo. Fumes and steam marking the site of another volcanic islet in the making can just be discerned in the background. (See also "Birth of an Island", page 14)

USIS

As the New Year opens THE UNESCO COURIER enters its twelfth year of publication. Five years ago it abandoned its tabloid newspaper presentation and appeared for the first time in the present magazine format. Since then THE UNESCO COURIER has grown in stature and readership, and it is now recognized as the major medium of cultural exchange and of international education for UNESCO. It is in fact the only international popular magazine of its kind sold and read not only in UNESCO's 81 Member States but in practically every country of the world.

The COURIER is now published monthly in four separate editions—identical in text, pictures and layout: English, French and Spanish editions published in Paris, and a Russian edition published in Moscow. In addition, a reduced Japanese version appears in Tokyo and a Danish version in Copenhagen. This year two new, full-fledged editions are scheduled to be launched: an Arabic edition for readers in the Middle East and other parts of the Arabic-speaking world; and a German edition for readers in Germany, Austria and German-speaking Switzerland. A notice will appear in due course announcing when the first number of these editions will appear.

In its contents THE UNESCO COURIER will continue to remain faithful to the goals it has set itself in the past: to serve as "A Window Open on the World" of education, science and culture through which every thinking man and woman can look out on to the broad global horizons of international understanding for which UNESCO is working. Each month it will continue to bring its readers authoritative information and food for thought presented in everyday language and in revealing pictures. Wholly non-political, its articles will portray, as in the past, the life and cultures of different lands, the art and literature, the science and education of other nations and describe the work of the United Nations, UNESCO and the other U.N. Specialized Agencies.

At this great moment of advancing history and expanding horizons, the Editors feel that THE UNESCO COURIER has its place in every home and in every school.

SUBSCRIPTION INCREASE IN FRENCH FRANCS

Despite a sharp rise in publishing costs the French franc subscription rate of THE UNESCO COURIER has not been increased during the past year. Recent decisions affecting the exchange rate of the French franc and the repercussions these have had on production and distribution costs now oblige us however to increase the annual French franc subscription rate as of February 1, 1959, to 600 francs, inclusive of postage. (This price increase is limited to subscriptions in French francs ; subscription rates in other currencies remain unchanged)

Present subscribers in France may, nevertheless, renew their subscriptions at the current rate provided renewals are received by February 15.

We trust that our readers in France will appreciate the fact that this increase in price is imposed by circumstances beyond our control.

U of M Bindery DEC 8 '58

VOLCANOES

Far more useful than destructive

by E. Aubert de la Rüe

SINCE ancient times volcanoes have struck terror and wonder into the heart of man. Yet there is much more to volcanic activity than the spectacular and awe-inspiring eruptions which sometimes cause great destruction. Comparatively few volcanoes are really dangerous and many of them are merely "noisy neighbours" to those who live nearby causing only a slight nuisance. The share of good which volcanic force has brought to the world has too often been obscured by the violent outbursts of a few highly active cones.

In recent geological times, volcanoes have thrown up a multitude of islands dotted among the oceans and seas of the world which have added some hundreds of square miles to the land surface of the earth. Their real value to man however, lies in the widely varying uses to which they can be put. On the continental land masses volcanoes have raised up mountains which have done much to increase what would otherwise have been a scanty rainfall. And the peoples of the tropics often have a lofty volcanic cone to thank for a more temperate climate.

The greatest benefit so far brought by volcanoes, however, has been the fertilizing effect of the lava and ash they eject. The soils formed by the decay of these volcanic products yield rich harvests in many countries. This fertility accounts for the amazing density of population in the neighbourhood of many active craters. Forgetful of past catastrophes and heedless of the dangers that still threaten them, farmers have settled in large numbers round Etna and Vesuvius and volcanoes in Central America, Indonesia, the Philippines and Japan, but they now run fewer risks than their forefathers. In the past few decades observation posts have been set up alongside the most dangerous craters, so that an impending eruption can be detected and warning given in good time.

For a long while no attempt was made to harness the enormous power generated by volcanoes. Even in quite subsidiary forms it was put only to such domestic uses as heating and cooking or was employed therapeutically in the form of hot mineral springs. Today the remarkable technical achievements of Iceland and Italy are serving as a spur to the harnessing of geothermal power for use in industry. In a few years' time, other countries, particularly those with few other sources of natural power, are likely to be drawing more and more on the inexhaustible power offered by volcanoes.

The number of active volcanoes is not known exactly, but has been estimated at between 400 and 620. These

figures relate only to eruptions on continents and islands and not to those which occur on the ocean-floor but which do not rise above sea-level; the exact locations of some 80 such craters are known, most of them being in the Pacific.

As a rule, volcanoes are regarded as active if they have erupted in historic times or if they are fumarolic that is, if they have a vent from which vapour issues. Also included in this category are some recently discovered cones situated in remote, deserted regions, about whose past information is lacking but which are intact and appear to be of recent formation. Several of the major eruptions that have occurred since the beginning of the Christian era have come from craters which for long showed no sign of life and appeared to be quite extinct. The deceptive nature of this inactivity has therefore to be taken into account when making a classification of volcanoes. Account must also be taken of new volcanoes which make an unexpected appearance from time to time, such as Jorullo in 1759 and Paracutin in 1943, both in the State of Michoacan in Mexico, and the cone of scoria—the newest arrival in the volcanic world—which rose up in 1957 from the sea near the island of Fayal in the Azores.

FIERY LAKES OF SEETHING MOLTEN ROCK

Among the strangest and rarest of all the world's volcanic phenomena are the lakes of boiling lava in which innumerable tons of molten rock bubble and fume incessantly. Few remain permanently in this state, most of them drying up periodically until reactivated by new eruptions. The best known of these fire-pits are found on the opposite sides of the earth —in the centre of the Pacific Ocean and in the heart of Africa. Those of the Pacific are Savii in the Samoan Islands and the great crater of Kilauea on the island of Hawaii in the Hawaiian National Park. Today the only large-scale lava lake that is permanently active is in the volcano of Niragongo in the Belgian Congo. (See next page) Fiery flow of lava (left) was photographed at night in the crater of Niragongo's neighbour volcano Nyamlagira. At the start of this century Nyamlagira was the most active of Africa's volcanoes and possessed a large lake of molten lava. From January 1938 until the end of 1940 it was almost constantly in a state of eruption which culminated in the collapse of its cone and central crater. At the same time its lake of lava dried up

© Haroun Tazieff, taken from the film "Aux Rendez-vous du Diable"

Probably not more than fifty volcanoes above sea-level can properly be described as in a present state of eruption. Most of the others regarded as active are very intermittently so, and have long periods of quiescence between eruptions. Cones which are continually aglow and smoking like those of Stromboli in the Mediterranean, Izalco in El Salvador, the "Lighthouse of the Pacific" whose red glow is visible at night from far out at sea, and Iahue on Tanna Island in the New Hebrides are few and far between.

It is accurate enough to say that about 500 volcanoes are active in varying degrees. They are thus only a fraction of all the world's thousands of extinct volcanoes. Some of these are still well preserved while others are so eaten away by erosion as to be scarcely recognizable, although the weird and spectacular shapes into which they have sometimes worn are characteristic of former volcanic regions. They stand as reminders of a period of intense activity within the earth which ended with the dawn of the quaternary geological period, and show quite clearly how present-day vulcanicity has declined compared with that of the past.

Today's volcanoes are not distributed at random but can be traced along or not far from zones in which the earth's crust has become dislodged and weakened. They seldom are found singly but usually in rectilinear or semi-circular formations, particularly in the case of island volcanoes. Some parts of the world, such as Australia and most parts of Europe and Asia, have no active volcanoes at all, whereas others, such as the two Americas, the Pacific seaboard and the median ridge of the Atlantic have a very large number.

The differing degrees of activity shown by volcanoes depend on the chemical composition of their lava and on the latter's temperature and vapour content, for these factors determine the fluidity of the lava. Though eruptions may therefore be divided into several classes, there are two main types.

The first are the effusive eruptions, marked by what is often a gentle outflow of relatively fluid, dark-coloured lava. Mauna Loa and Kilauea in Hawaii, Etna in Italy and most of the basaltic eruptions usually belong to this type. These outflows, some of them extending twelve miles or so, are a danger to crops and houses but seldom imperil the lives of the

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Photos © Haroun Tazieff

DESCENT INTO THE FIRE-PIT OF NIRAGONGO

In September 1958 a Belgian expedition, one of the scientific research groups set up during the International Geophysical Year, set out to explore the volcanic crater of Niragongo which stands in the 3,000 square mile Albert National Park of the Belgian Congo. Rising to nearly 11,000 feet and flanked by two extinct volcanoes, Shaheru and Baouta, it has boulder and lava-strewn crater walls which drop down vertically in a series of gigantic steps to a vast lake of lava hundreds of feet below. Until recent years it had been regarded as inaccessible because of its beetling cliffs and the poisonous fumes which rise out of the pit. In 1958, one of the members of the expedition was the French volcanologist and geologist, Haroun Tazieff who in 1948 and again in 1953 had attempted to reach the lake. The most recent attempt was successful. Members of the expedition were lowered by cable to the first terrace 600 feet below. A second descent of 500 feet brought them to a ledge from where they were able to observe the lake of lava at very close range, bubbling and seething at temperatures varying between 1,000 and 1,200 degrees C. Photos, taken during the 1958 expedition, show, above, one of the party about to descend Into the crater; right, a 600 feet high cliff forming the first "step" down into Niragongo's giant crater.

© E. Aubert de la Rüe

VOLCANIC WASTELAND, stretching as far as the eye can see, is in the dry, barren Bara plain of the Somali Coast. Stony "crop" covering the soil is composed of innumerable basalt rocks and boulders, the products of past volcanic activity.

peoples settled in their vicinity, who generally have time to flee before the approaching lava which seldom travels more than about fifty or at the most a few hundred yards an hour. The Hawaiian volcanoes have the swiftest flow, which for short distances and on a very steep slope, has been known to exceed eighteen yards a second.

To the second type belong the very much more formidable explosive eruptions. Highly viscous lava rises to the surface of the crater, giving off great quantities of gaseous products, and in particular water-vapour, which find difficulty in escaping. Explosions pulverize the lava creating large quantities of ash and incandescent, semi-solid lump which are hurled upwards. The lighter materials, obscuring the discharge of vapour from the crater, may be carried far afield by currents of air. The great volcanic outbursts have mostly been caused by this type of explosion, which commonly occurs in craters that have been so long dormant that lava from the last eruption has had time to solidify and stop up the "throat" of the volcano. A lengthy period of quiescence causes an accumulation of gases to be trapped in the heart of the crater, and this explains the tremendous power generated by volcanoes. The longer the time elapsing between two successive eruptions, the more violent is the fresh outburst likely to be.

In both historic and modern times, a number of volcanoes have won tragic fame for their disastrous eruptions. The eruption of Vesuvius, which in 79 AD. buried Herculaneum and Pompeii beneath its ashes is perhaps the best known in history. Then there was the terrible explosion of Tambora, on Sumbawa Island in 1815—one of the most staggering of all times—which claimed 50,000 victims and cut 4,000 feet off the height of this mountain. In 1886, a similar explosion literally ripped open the slumbering volcano of Tarawera in New Zealand forming a fissure several miles long. The eruption transformed the topography of the area, but claimed few victims in this sparsely populated region. A few years previously, in 1883, the eruption of Krakatoa in the Strait of Sunda devastated an island, causing 36,000 deaths. Other memorable catastrophes occurred in Nicaragua in 1835, when the peak of Conseguina was cut off, the explosion being heard nearly 1,000 miles away, in Japan in 1888 when Bandai San lost 1,950 feet of its height in a few seconds, in Guatemala in 1902, when Santa Maria buried a large area under a pall of ash, and in Martinique in the same year, when Mount Pelée wiped out the city of Saint Pierre with its 28,000 inhabitants.

The deadliest form of volcanic activity is the sudden recrudescence of volcanoes which have been so long dormant that they are regarded as extinct and are therefore left unwatched. The unexpected eruption of Mount Lamington in New Guinea, which caused 6,000 deaths in 1952, is a recent case in point. Most of the great volcanic disasters have, in fact, been caused by surprise outbursts from dormant craters. Nowadays regular observations are usually made on craters which show intermittent activity, and a special alarm system is arranged to warn people living nearby of impending danger. The most dangerous volcanoes which are surrounded by rich farmland with a dense population or those which are situated near towns and cities, are increasingly watched over by experts. Vulcanology and geophysics have armed these specialists with up-to-date detection devices such as seismographs, geophones, and recording thermometers, as well as analyses of gas content, gravimetric measurements, and detection of possible changes in the surface of the ground by very accurate levelling of the approaches to the volcano. There have been many successful forecasts of eruptions, the most famous of which concerned the 1914 eruption of Sakura Jima in the Bay of Kagoshima in Japan; sufficient warning was given for the whole population to be evacuated. Some of the world's best equipped vulcanological observatories are to be found on Vesuvius and Etna in Italy and on Kilauea, in Hawaii, as well as in Martinique, Japan and Indonesia. Planes and helicopters are now available, if not to stop the flow of the lava streams, at any rate to

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VOLCANOES *(Continued)*

alter their direction, by bombing the outflow points—a method which has often been successfully employed at Mauna Loa in Hawaii.

Man has found scores of uses for the materials ejected by volcanoes. From earliest times, volcanic lava, breccia and tuff, which are usually easy to work, have been used to build temples and palaces, individual dwellings and sometimes whole cities. In every age, outstanding works of art have been created with volcanic substances. Many primitive peoples were famed for their skill in making highly decorative objects from carved and polished lava. The Indians of the high Mexican plateaux and the Andes, and many South Sea Islanders, including the inhabitants of Easter Island in the Pacific and the Marquesas, are noted for such work.

A volcanic material highly prized by the peoples of antiquity was obsidian, a natural glass, or vitreous lava, extruded by certain volcanoes. It was universally employed for making utilitarian objects as well as for jewelry and ornamentation on account of its brilliance and iridescence. The few rich deposits of obsidian were deservedly famous. Those on the Island of Melos were celebrated throughout the Aegean. Before metals came into use the products of these deposits were in great demand for the manufacture of armour and various tools. In the pre-Colombian era, the inhabitants of the high Mexican plateaux used the obsidian ejected by some of their volcanoes for making knives, razors, arrow-heads and works of art. The most extensively worked deposits were on the Cerro de las Navajas (Mountain of Knives), near Pachuca in the State of Hidalgo.

Town built of pumice stone

SINCE 1946, obsidian has acquired considerable industrial importance on account of its expansibility. It is used for the manufacture of *perlite*, a very light material rather like pumice stone. Some obsidians have a high water content which enables them to expand to twenty times their volume when heated to a high enough temperature to soften them. The perlite obtained by processing the obsidian quarried in the West of the United States, particularly in Nevada, and also in Italy (Ponza Island to the west of Naples) and Sardinia, is used for the manufacture of light, insulating and incombustible building materials.

Pumice stone, with its very light, cellular texture, may properly be described as the natural foam of volcanic glass; it has many uses in industry and as a toilet requisite. This variety of lava is in use in a great many volcanic regions, but the finest quality comes from Lipari Island in Italy, which produces 50,000 tons a year for export. The pumice stone found in various parts of the world is an excellent building material. For instance, the town of Latacunga in the Andes of Ecuador was built entirely of pumice stone, as is also the huge dome of the church of St. Sophia in Istanbul.

The lavas of present-day volcanoes, unlike those of the past, are very poor in workable metals, but the outflows sometimes contain other useful substances. The volcanoes of Naples and of Green River in Wyoming U.S.A., for instance, are rich in potassium. Unfortunately, no cheap processes have yet been developed for the extraction of the potassium salts contained in these lavas.

One of the commonest volcanic products is sulphur, which has been regularly mined from a great number of craters, temporarily reduced to the status of sulphur-springs. They are still being worked in some countries, but volcanic sulphur deposits are small, scattered and difficult of access and are being abandoned more and more in favour of sedimentary deposits of sulphur such as are found in Sicily and Texas.

Volcanoes bring from the bowels of the earth reserves of mineral matter essential to plant life. They are also one of the sources of the carbon dioxide contained in the atmosphere, without which plants would not be able to grow. Lime, phosphoric acid, potassium and other nutritive salts are constantly being drained from the soil by plants and the run-off of water, but are replaced to some extent by volcanoes which replenish impoverished

MOUNTAIN GROWN FROM A CORNFIELD

soils by furnishing a regular supply of elements necessary to cultivation and plant life in general.

The over-abundant showers of ash from some explosive eruptions naturally bring disaster and ruin—for a time at least. Yet the havoc they wreak is generally confined to a small area and is of less importance than the prosperity volcanoes bring to many agricultural districts. Moreover, their beneficial effect is felt far beyond their normal radius of activity, for they send up fine dust into the air to such a height that it is carried long distances by atmospheric currents.

The fertility of the soil thus formed on the slopes of volcanoes has always been a magnet to farming communities. Observing the infrequency with which volcanoes give vent to their destructive forces, the farmers consider that the rich harvests reaped from land where lava once flowed fully justify the risks of cultivation in such relatively dangerous localities. All the disasters of the past have never prevented man from clinging to land in the proximity of volcanoes and even the threat of an imminent eruption is not always enough to make him abandon soil which gives such flourishing crops.

The slopes of Vesuvius and Etna, famous for their vines

Photos © E. Aubert de la Rue

On February 20, 1943, a Mexican farmer was ploughing his cornfield near a village some 200 miles west of Mexico City, in a region of recent volcanic activity in the western Sierra Madre. Suddenly he saw a spiral of steam rise from a small depression in the ground, then the earth began to crack and raise itself and finally a huge column of black smoke rolled upwards—a new volcano, Paricutin was being born. By next day it had built up a cone more than 50 feet high. In puffs that occurred every six seconds it ejected cinders, ash and bombs of solid rock estimated at 2,700 tons a minute. Within six months the cone (above, right) was 1,000 feet high. Paracutin provided what was termed "the most splendid firework show of all time" but the volcano also engulfed villages in a sea of lava. Top of church tower can still be seen (above, left) above the advancing lava. Paracutin, which erupted for nearly ten years, was the first volcano in history to be observed scientifically almost from the moment of its birth.

and orchards, are not the only volcanic sites thus sought after; the sides of volcanoes in Central America, covered with rich coffee plantations, and those of Java, the Philippines and Japan are equally coveted. In the tropics a host of volcanic islands have been turned into Gardens of Eden where every kind of tropical fruit is grown. The Canary Islands, the Azores, the West Indies, Sao Thoma, Fernando Po and Reunion are but a few examples.

For a long time man had no defence against volcanic eruptions and his chief feeling about them was one of helplessness in the face of the irresistible forces they unleash. Yet for centuries his imagination has also been stimulated by the possibility of tapping the tremendous reserves of power locked up in the depths of volcanoes. Only in relatively recent times, however, has this dream become an industrial reality. We are not as yet at the stage of making direct use of the enormous power released by erupting volcanoes, but at least various countries are beginning to put some of the secondary forms of volcanic activity to work for them. With modern equipment it is possible to sink bores to great depths and thus reach very high temperatures. Today it is no longer fanciful to consider the possibility, within the near future, of drawing off the incandescent gases generated in the underground reservoirs of volcanoes.

Ideas which not long ago appeared Utopian are now becoming facts. The natural vapour given off in large quantities near Lardarello in Tuscany, Italy, has for long attracted attention because of its special properties and its industrial possibilities. Italian engineers not only work these natural steamholes or *soffioni,* but they are now drilling down to a depth of nearly 2,000 feet, where the superheated vapour is captured and directed through reinforced pipes to steam generating stations, now producing some 300,000 kilowatts. In addition, the *soffioni* are used for chemical purposes, such as the extraction of boron, carbon dioxide, ammonia and various other industrial gases. Research into the uses of geothermal power is being conducted in other parts of Italy, particularly in the Phlegraean Fields, the Euganean Hills, at Viterbo in Latium, on the islands of Ischia and Vulcano and round Sciacca in Sicily.

The Icelanders too have made extensive use of the hot springs which abound on their island as a subsidiary phenomenon

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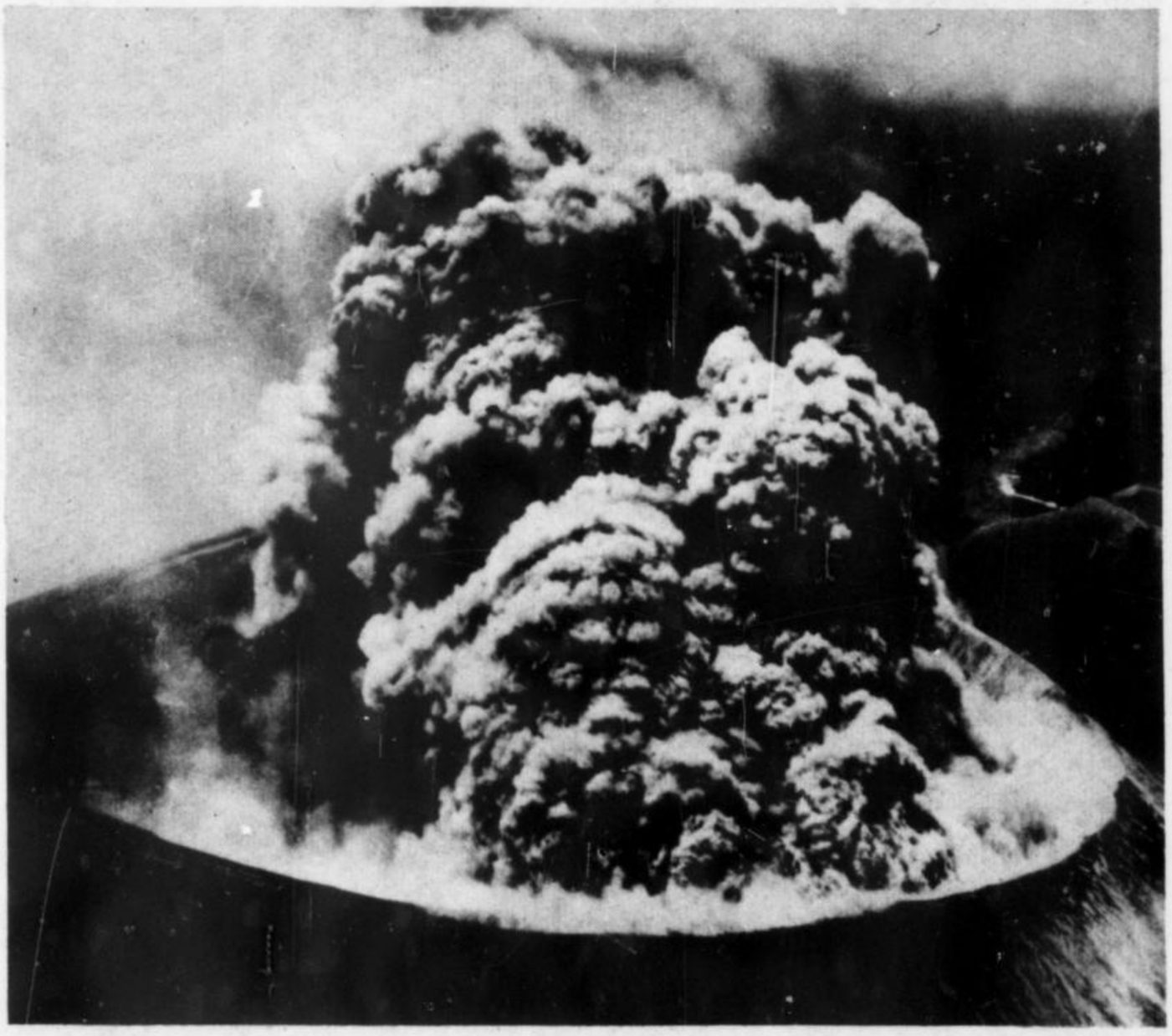
© C.N.R.S., Paris

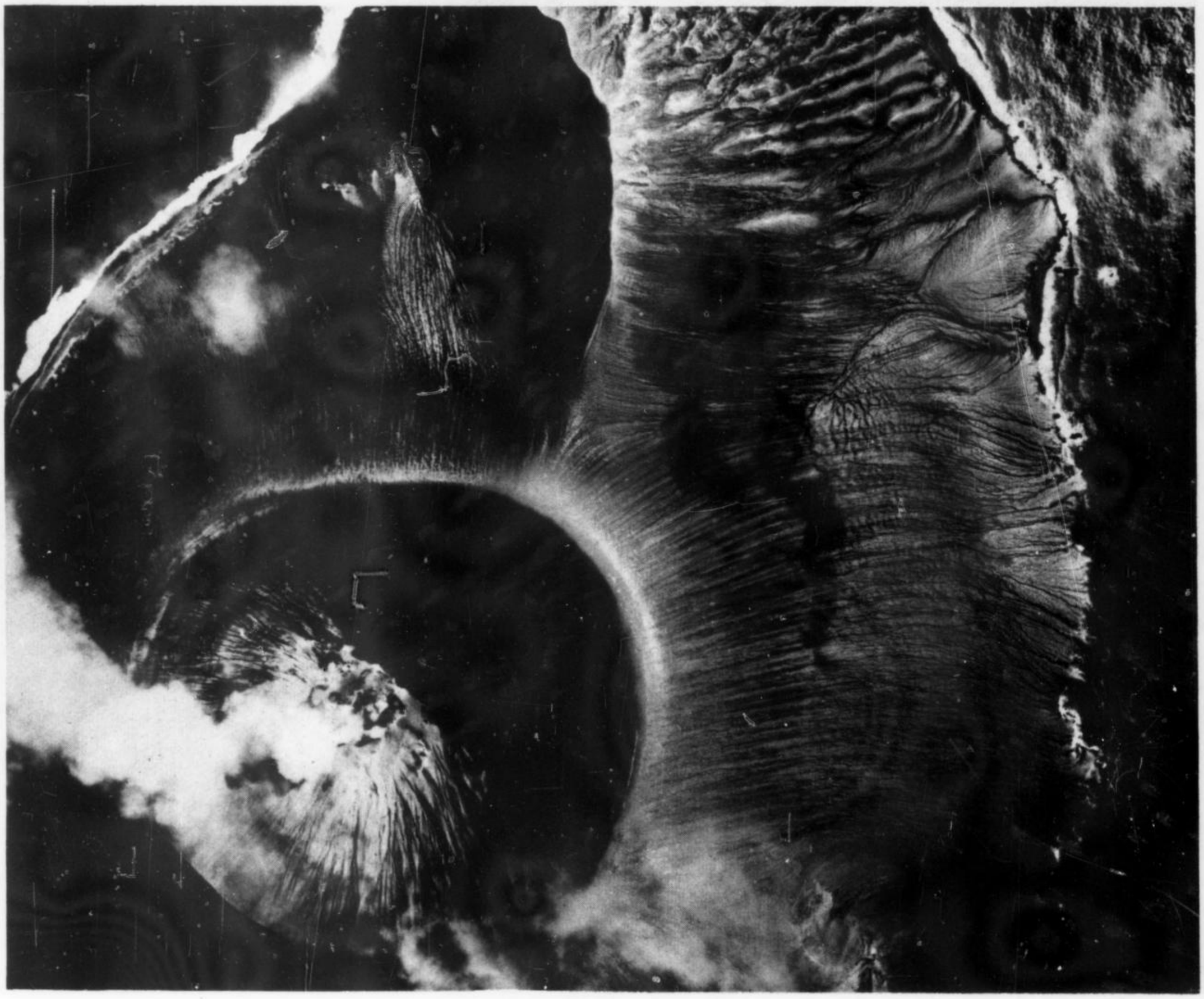
LULL IN ACTIVITY of one of history's most famous volcanoes, Vesuvius, in the Bay of Naples, gave air-photographer a chance to take this clear shot of its crater. Today Vesuvius is about 3,600 feet high, but once it may have been twice that height since traces have been found of a very large crater that was blown away in pre-historic times. After the eruption of 79 A.D. which buried Pompeii, Herculaneum and Stabiae, Vesuvius was less active until the great eruption of 1631. Since then it has never been really quiet, but when it is at its quietest it is possible to climb up and stand above the crater.

GIANT WITH TWIN MOUTHS

Two moods of a twin-mouthed volcano, Boqueron, off the west coast of Mexico, captured in aerial photographs. Right, a dense cloud of vapour and ash spouts upwards as the volcano erupts. Below, a thin plume of vapour rises from one of the twin mouths of the Boqueron crater. Run-off of molten lava down to the sea has outlined the contours of this volcanic island. Mexico is a land of volcanoes. Starting at its border with the United States is the beginning of a chain that is practically unbroken until it reaches the southern end of South America. The great Mexican peak, Mount Popocatepetl, which rises to 17,888 feet, is one of the highest active volcanoes anywhere in the world today.

USIS photos

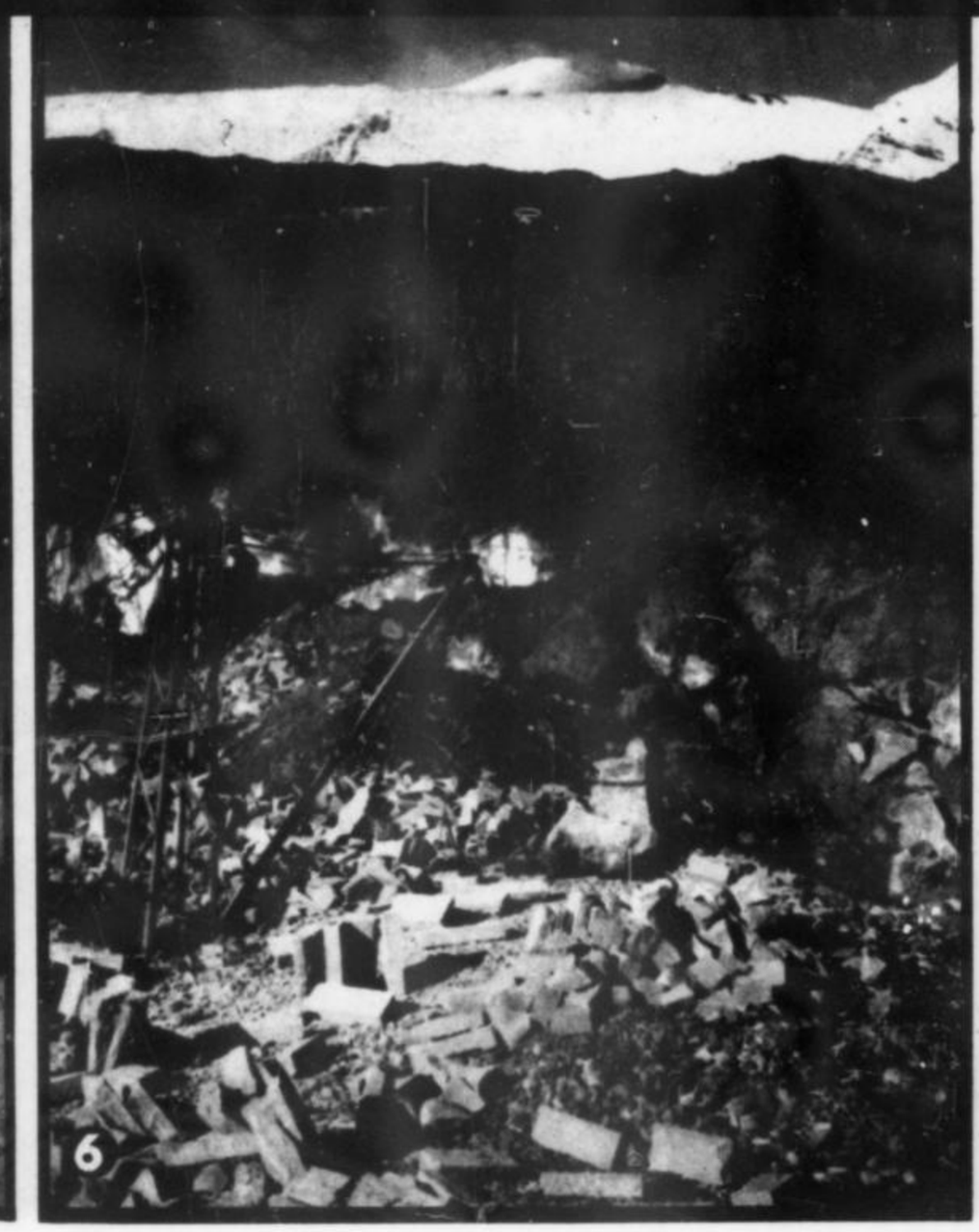


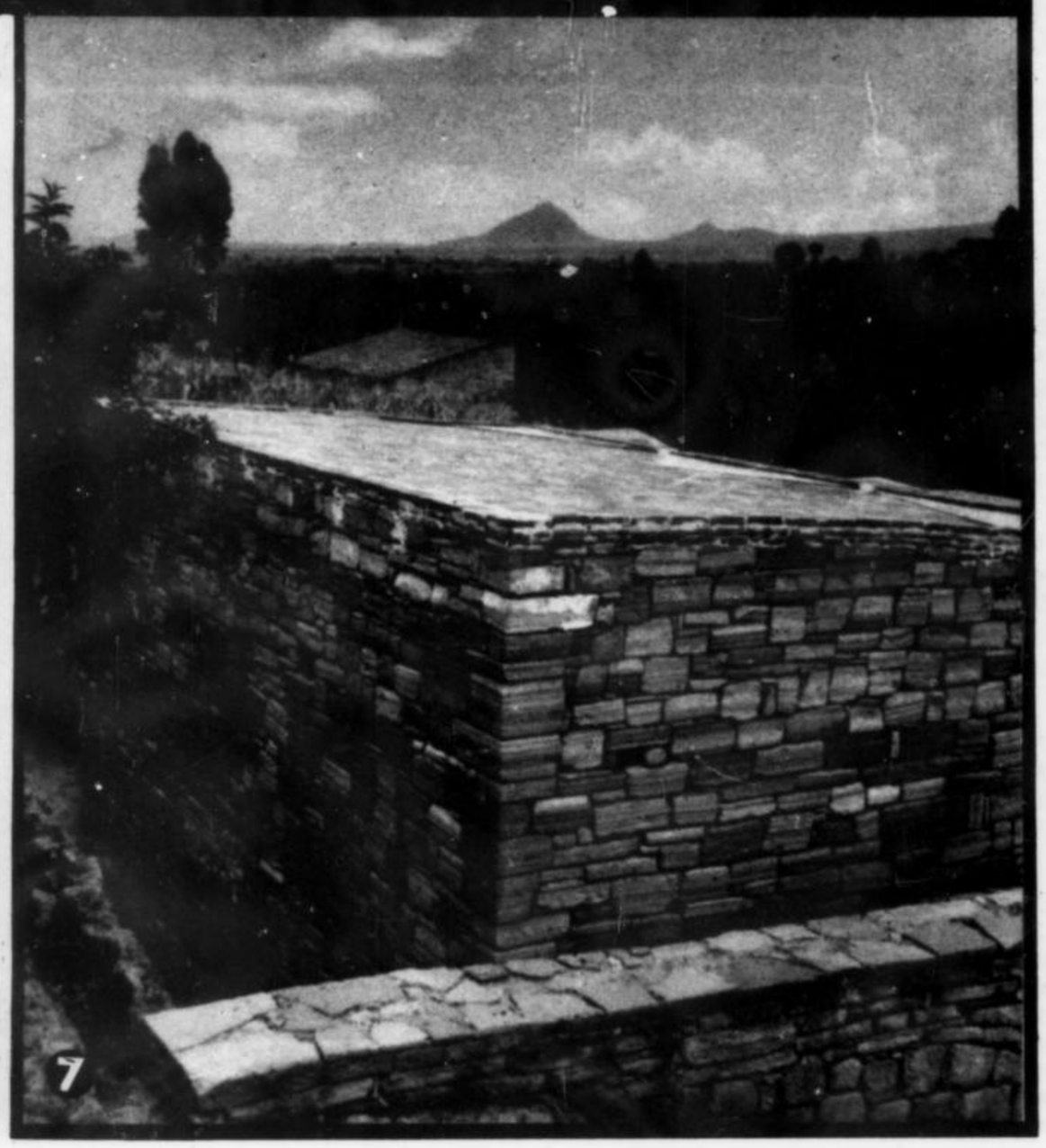


RICHES SPEWED FROM THE WORLD'S VOLCANOES

Man has found scores of uses for the materials ejected by volcanoes. Pumice which comes from lava has long been used for grinding and polishing; and for the building of roads. Sulphur, another volcanic product, is used for making chemicals. Volcanoes bring up from the bowels of the earth reserves of mineral matter. Soils formed by the decay of volcanic matter yield rich harvests in many countries. On the Continental masses eruptions have raised up mountains which have done much to increase rainfall while the peoples of the tropics have often a lofty volcanic cone to thank for a more temperate climate. The remarkable technical achievements of

countries like Italy and Iceland in harnessing geothermal power are encouraging other nations to develop the use of the inexhaustible power reserves offered by volcanoes. Photographs on these pages, illustrating some of the benefits brought by volcanic activity, show : (1) Deposit of pure sulphur in the sulphur spring on Vanua Lava, one of the Melanesian group of Pacific islands (2) Travertine deposit created by a hot spring in French Somaliland. Travertine stone from Italian deposits forms the principal building material of Rome. (3) Generation after generation of farmers have cultivated the slopes of Etna in Sicily. Splendid orchards of olive, lemon orange, fig, and almond trees and vineyards, are nourished by the rich soil covering the sides of the volcano. (4) Thermal springs near Lake Rotorua in New Zealand. The wonderland of hot springs and geysers in this area is a major tourist attraction. (5) Disused pumice-stone workings at Latacunga in Ecuador. Nearby is one of the highest volcanoes in the Andes, Cotopaxi, which rises 19,498 feet. (6) Quarrying for stone—basaltic rock—on the slopes of Mount Etna. The distribution of basalts is world wide, often occurring in immense masses. (7) House built of blocks hewn from pumice in Tlaxcala, Mexico. Photos 1, 2, 4, 5, 7 ( ) E. Aubert de la Rüe — 3, 6 ( ) H. Tazieff.





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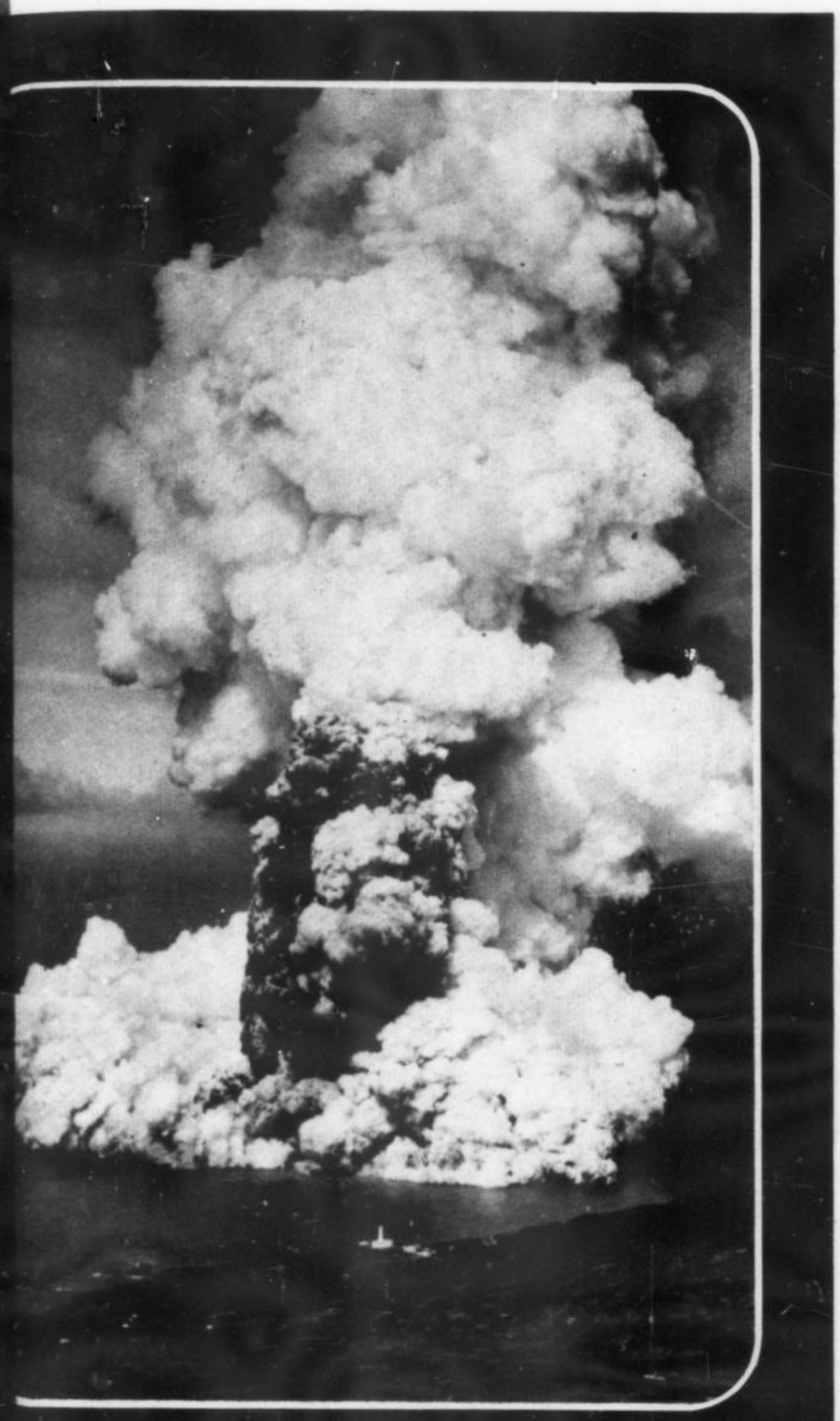
BIRTH OF AN ISLAND

For just over one month in 195 the nine Portuguese islands cal ed the Azores, a group 400 mile long, almost midway betwee North America and Europe, be came ten. On September 28 submarine eruption took plac just off the island of Fayal an a volcano emerged from the se about 400 yards from the light house of Punta dos Capelinhos Its apparition had been preface by slight earth tremors followe by a violent shock which damag ed the village of Capelo an spread panic among the inhab tants. At the same moment th sea began to boil, flames an vapours rose from it and soon fierce column of smoke an cinders shot high into the ai On October 7, a sudden chang in wind direction carried a rai of ash and cinders onto the islan of Fayal and partially buried th now deserted village of Capel Three weeks after it first appea ed the crater of Ilha Nov (New Island), shaped like horseshoe and giving off a dens cloud of smoke, vapour and ci ders, had risen over 600 fe above the waves. (Photos o these pages show the progre sive stages in the growth of Ilh Nova.) After some three week the eruption began to die dow and finally ceased on Octob 29. The sea made short work the cinders forming the cone Ilha Nova and within a few day there remained only a wav swept rock, shrouded by th wisps of vapour rising from th site of the former crater. The v garies of submarine volcano are responsible for the appea ance of such short-lived island which have varying lifetime though rarely longer than a fe months. Some disappear on to reappear once or even sever times at later dates. "Disappea ing islands" of this type hav often given rise to diplomat claims by nations seeking to i crease their overseas territorie



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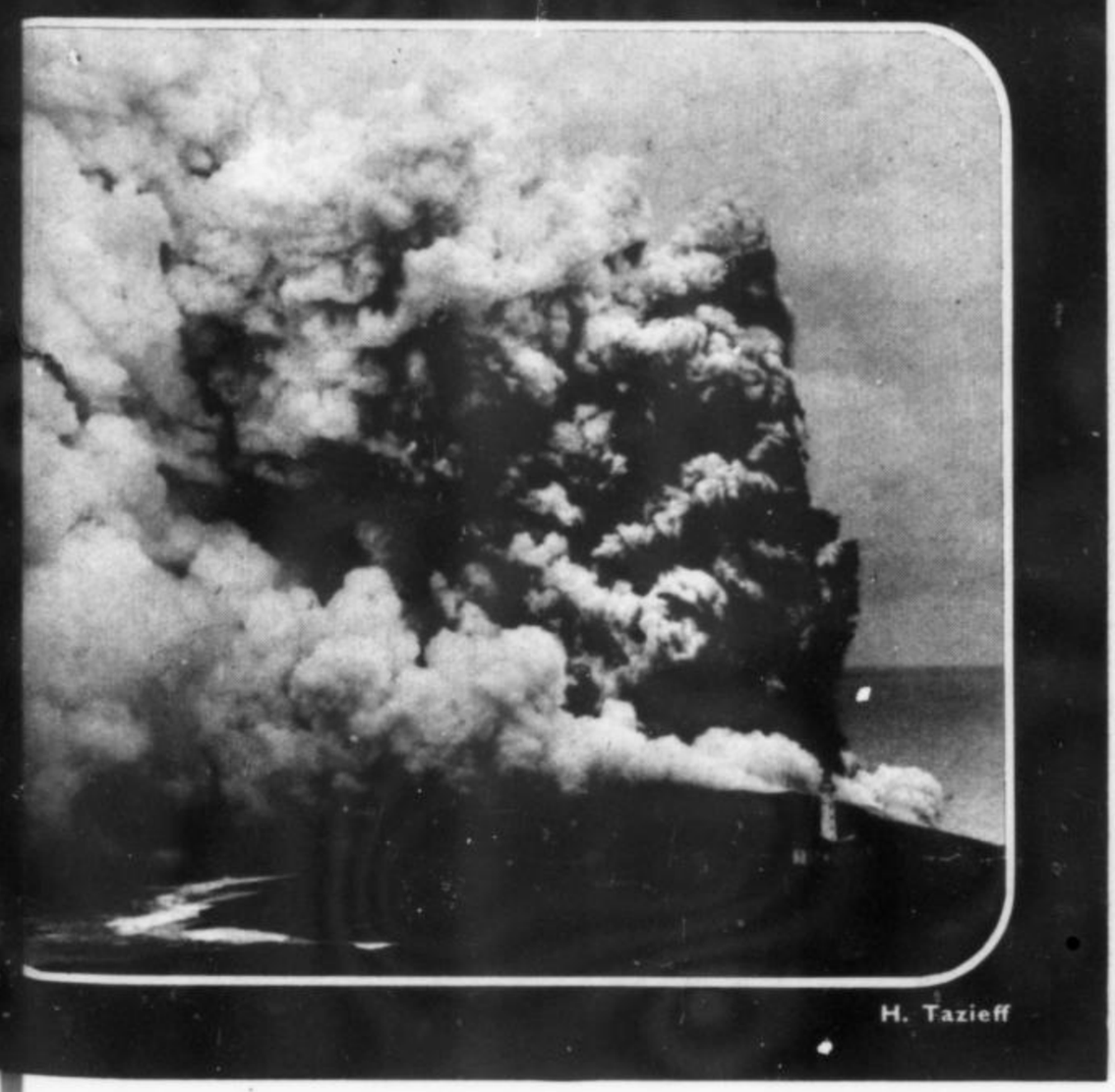


H. Tazieff

VOLCANOES

(Cont'd from page 9)

of volcanism. Since 1930 a system has been in operation for supplying homes with hot water from springs. At Reykjavik, the capital, nearly 3,500 homes are now heated with water at 185° F. The town also has several swimming-pools maintained at 98° F and public wash-houses supplied with natural hot water. Villages and even isolated farms now have their hot water supply as well. Of special interest is the use by Iceland of hot springs for the heating of hot houses, where many varieties of fruits, vegetables and even flowers can be grown, despite the cold climate.

Elsewhere too, a good deal of research has been devoted in recent years to the possibilities of using the heat locked up inside the earth as a source of power. This research has been carried furthest in California, the State of Hidalgo in Mexico, the Republic of El Salvador, the district of Wairakei in New Zealand, famous for its hot springs, and in East Africa and Japan.

Terrifying and destructive as eruptions may be, they are a magnificent sight to watch with their dark columns of ash, their great billows of vapour shot through with flashes as brilliant as a firework display, their fuming streams of lava and the blazing craters glowing red against the night sky. The splendour of active volcanoes and the strange subsidiary forms they take, such as sulphur-springs, geyser jets, mud volcanoes and other varieties of hot springs attract many tourists.

Extinct volcanoes, many of them weather-beaten and crumbling, are often surrounded by enchanting scenery. The charm of old volcanic regions such as the Eifel in Germany, Auvergne in France and the Polynesian archipelagoes, once thrown up by a long series of eruptions and now sculpted into weird shapes by erosion are well known. The old eroded volcanoes of the Society Islands, the Hawaiian archipelago and the islands of the Atlantic, from the Azores to the West Indies, by way of the Canary and Cape Verde Islands, are equally celebrated.

Geyser & hot spring parks

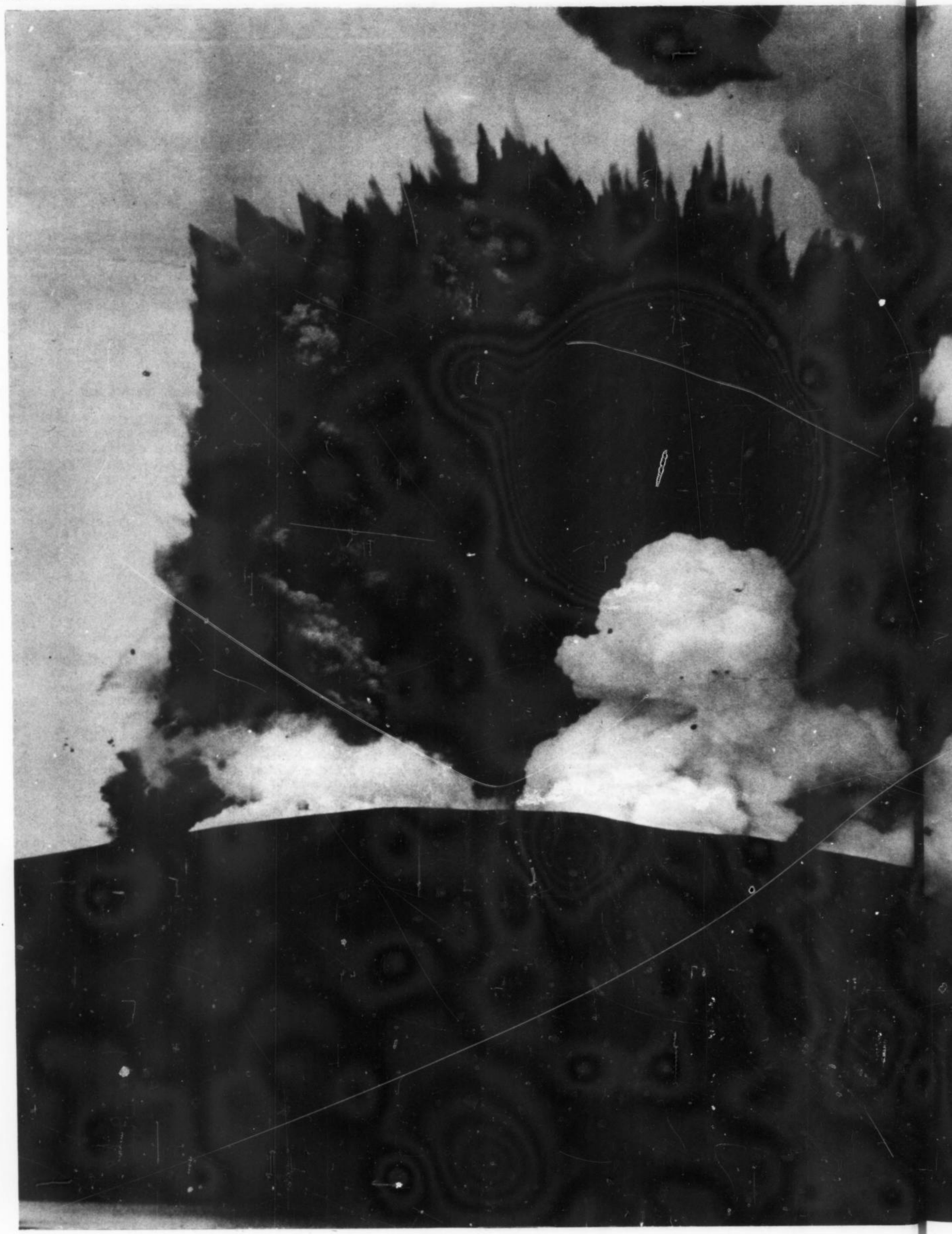
Extinct craters, where lakes have formed from the gradual accumulation of rain water, some of them a perfect circle, are a curiosity of many volcanic sites. The impressive grandeur of some of these lakes has made them deservedly famous as beauty spots. But the special configuration of many old craters also enables man to make other uses of them. Those which form a natural enclosure—as at Aden in Arabia—can serve as reservoirs; other old craters in Mexico, Patagonia and the Andes, are prized as farmland, as they afford shelter for crops against strong winds. Where the explosion of an island volcano has opened a large breach in its wall, an excellent natural harbour may be formed if the sea breaks into the crater.

In the past man's chief reaction to volcanoes was fear. Today as this is replaced more and more by one of interest, many countries with active or extinct volcanoes on their territory are taking the trouble to preserve the surrounding sites in their natural state. Many of the finest volcanoes have now been converted into National parks. The United States of America has taken the lead in the preservations of volcanic sites and has created some fifteen famous parks, including Yellowstone National Park with its geysers and pools of boiling water, Greater Lake National Park in Oregon, the park surrounding Lassen Peak in California, and others in Hawaii and elsewhere; in them visitors can observe past and present volcanic activity in a wide variety of forms. Other countries also have some very fine volcanic parks.

Thus it can be seen that in addition to bringing havoc and also being of value to man the world's volcanoes make first-class recreation centres, for in action they provide natural spectacles of awe-inspiring beauty and scenery of tremendous grandeur.

E. Aubert de la Rüe, author of this article, is a French geologist who has carried out numerous surveys and missions in different parts of the world. In 1953 and in 1956 he went to Brazil on Unesco technical assistance missions. Since October 1958 he has been entrusted with a new Unesco mission as chief of a survey of natural resources in South Chile. He is the author of many works on geographical and geological questions, the most recent being "L'Homme et les volcans" (Man and Volcanoes) published by Gallimard, Paris.

BIRTH OF AN ISLAND *(Continued)*



CHOKED BY A RAIN OF BURNING CINDERS

Shortly after it emerged from the sea, the volcano of Ilha Nova began to shower clouds of dust and cinders on the nearby island of Fayal. Great submarine explosions which rocked the new volcano (left) sent tremendous showers of debris high into the air from where it was blown inland by the wind. Houses, crops and pasture land were covered by a thick layer of cinders, under whose weight roofs caved in (below). Thousands of acres of land were covered under debris to a depth of several yards through which streams fed by torrential rains carved out deep fissures (above). Innumerable fish choked by cinders were washed ashore.

Photos © Jovial, Fayal, Azores

THE TRUE MEANING OF AFRICAN DANCES

by Keita Fodeba

DURING the many tours our troupe has made in France and other countries, I have noticed that for most Europeans, the authentic African dance show corresponds to the single idea they have formed of Africa from attending a lecture or seeing a film.

But this idea is bound to be wrong, for Africa is a much larger continent than Europe and more varied. A film made of any given part of Africa cannot entirely reflect the essential character of our different regions, in the way that France, Germany or Sweden, for example, could never become identified to the point of merging into one psychic entity. Senegal and the Congo are as different from each other as Finland is from Italy. And has not modern science endowed the West with a number of means of human contact as compared with our so-called "primitive" countries, where Nature still weighs heavily on man, often isolating him from his nearest neighbours? It seems to us consequently tendentious to try systematically to classify the whole of this vast continent by reference to the colour of its inhabitants. The influence of background upon man is far more important than that of the degree of pigmentation of his skin. A thousand historical examples prove this eloquently enough, be it a question of white, black or yellow races.

Nevertheless, we do not think that the influence exerted by geographical or social surroundings, however powerful this may be, is alone sufficient to mould man. As far as we, the black peoples of Africa, are concerned, it is obvious that whatever may be the degree of assimilation of foreign cultures as a result of being many times uprooted, it is still historically too early for us to lose all our African ethnical characteristics.

Our transplanted brothers have generally been placed in such political, moral and material conditions, that as a result of retiring within themselves so often they have reinforced their psychic bonds with our continent. Owing to the dominating effect of conditions of environment upon the individual, it would seem difficult to speak of a culture of the Negro

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RHYTHM AND MOVEMENT are media by which the people of Africa express their feelings in a language of dance as intelligible as speech. Characteristic of the life of Africa, the dance can become ritual, magic, witchcraft, exorcism, an expression of freedom, of morals and varied sentiments... for dance is able to reach to man's instincts and subconscious powers and to express him completely.

Zulu dance. © Paul Almasy, Paris

AFRICAN DANCES

(Continued)

World. Yet, to the best of our knowledge, nowhere in the world during the long years of their tragic expatriation have the black races enjoyed social and economic conditions which were sufficient to destroy utterly their original ties.

On the one hand, Africa being the land of origin of the Negroes, we can probably deduce that for a long time, and wherever they are, they will retain something ancestral which will link them to their African brothers. On the other hand, when we consider the fate reserved, generally speaking for the black man in the so-called "civilized" world, we are obliged, in the present circumstances, to recognize and wish for a certain identity of aim in culture. "Every culture worthy of the name, must be able to give and to receive," it is said. And the added merit of the black cultures will be that they all have the same legitimate desire to defend the cause of an unjustly used race.

When drawing up the programmes of the African Ballet Company, our constant concern is to avoid misleading the public by presenting a fictitious picture conforming to the usual preconceived idea. To make Africa and all its variety known, we have chosen dance, not only as an excellent means of universal expression but also because, with us, it is connected with all the other arts.

African dance indeed, far from being the autonomous art that it is in Europe, is primarily a union of rhythm and movement. A characteristic phenomenon of our life, it can become ritual, magic, witchcraft, exorcism, an expression of freedom, morals and sundry sentiments... for dance is able to reach to man's instincts, to his subconscious powers and express him completely.

In all countries of the world, there are as many forms of dance as there are peoples, customs, cults, traditions and ethics. The differentiation between the arts in Europe has progressively raised dance to the status of ballet by detaching it from the life of the people, of which in Africa it is a spontaneous emanation. The developed form of dance, self-conscious and no longer imitative, collective or religious but a creation in itself, has existed in Western culture for many centuries.

This progressive tendency to intellectualize the dance, which seems to be in proper relation to progress, seems to forget the fact that the arts at the beginning sprang from necessity, that is to say, they were created in response to a vital need. Ballet, in its Western conception, is an original choreographic and musical creation. Our popular African dances hardly yet correspond to this. But if ballet is "a form of artistic and cultural expression developed by man in his endless quest for new means of expression, in his yearning to create forms which are ceaselessly renewed according to his genius and abilities", African dance as a means of expression and of exteriorization can be identified with ballet. That is the reason why we call ourselves the "African Ballet Company" with the conviction that our songs and dances will have some significance for all who have correct ideas about life in Africa.

If, in Europe, dance must necessarily aim at grace and beauty, be aesthetic as well as expressive of an idea, in our peaceful African villages, we still learn to sing and dance just as one learns to talk. Nobody dances for his neighbour but, instead, to express what he feels, translated by the rhythm of his movements and his body into a language which, although different from speech, is no less intelligible. Moreover in a country where drums can send messages to great distances, it would be impossible to dissociate music and dance for the rhythms of sound and those of the body have the same capacity for expression. A step evokes a rhythm as much as a song involves a dance figure.

Photo Ilse Steinhoff, from the film "L'homme contre la jungle"

CIRCUMSTANTIAL DANCES are as numerous and as varied as events in daily life in Africa and they are chiefly characterized by a strong element of improvisation. Thus, to the rhythms of the tom-toms and the balafons, the whole village will join in a common celebration for the return of a soldier, a successful hunting trip or the reconciliation of two tribal chiefs.

© Pierre Verger

RITUAL CEREMONIES are nearly always accompanied by dances of symbolic character. Each African dance has a definite reason behind it. There are traditional dances based on history or ceremonial rites, just as there are also circumstantial ones which originate in the innumerable aspects of human existence. Photo shows a ritual dance performed in Dahomey.

Neither would it be possible to understand the essential part played by dance in the life of the African peoples if one did not bear in mind their conditions of life. When a body has the lightness and the flexibility of a "liana", who could prevent it from dancing? When the economic stage is essentially agricultural, involving few needs and material worries why not move like a bird or snake, open like a flower and so be in communion with Nature and the mysterious powers which people it and animate it?

If one remembers these circumstances it is easy to see why the Africans are, so to speak, the real men of dance. For the very rhythm of their existence is already an invitation to dance—a simple rhythm in common time, which can be translated into the following needs:

— to work for the community

— to enjoy the fruit of common labour

— to honour the gods who protect man during his life and safeguard him after death

— to exteriorize the cause and effect of these activities by song and dance.

One should not however deduce from this that if our people rhythmically stamp the ground in the public place in the village, they do so unconsciously, like a leaf shaken by the wind. Not one of our dances it performed without a definite reason. Just as there are traditional dances based on history or ceremonial rites, so there are circumstantial dances which arise from innumerable circumstances of existence.

In this way, when the Mandinga civilization was spreading over a large part of the Continent, the vulture which usually hovered over the bodies of the fallen, was regarded as a symbol of bravery and courage. A dance was dedicated to him, which the more intrepid warriors solemnly executed after a victory. Today, the Mandinga tradition has adopted this "Dance of the Vulture" as a token of honour and no one has the right to dance it who does not deserve to do so through some brilliant feat of arms or if he has not been authorized by the Council of Elders.

A thousand dances of this kind stand out as landmarks in the history of Africa and help to explain it. In return, popular tradition has created, through the centuries, other dances, the character of which is also symbolic, but which are dedicated to ceremonial rites. Such are those which, among the peoples of Upper Guinea, mark the initiation of the child at puberty to the principal duties of life. First, bewitched by the traditional rhythms, the initiate is possessed by the devils of his own natural bad tendencies; he dances until he loses consciousness. He is brought back to life by the witchdoctor whose exorcism then points out the path of good to the child... As for the circumstantial dances, they are as numerous and different as the happenings of life and are mainly characterized by the large part left to improvisation. In this way, for instance, to the rhythms of the tom-toms and *balafons*, the whole village will celebrate the return of a soldier, a successful hunting trip or the reconciliation of two tribal chiefs.

It is, moreover, important to note that a celebration of which the original character is completely circumstantial, may be periodically repeated later without in any way becoming part of the cycle of ceremonial rites. The best example which illustrates this is certainly that of the clearing of the land. At the beginning of the rainy season, the whole village gathers at the call of the drums to cultivate together, in common, the field of every head of a family. And at night, by moonlight, this form of mutual assistance enjoyed without distinction by all the families, is the occasion for great festivities and joyful dances.

Yet, although all is replete with art and poetry, there are still some people for whom an African folklore performance is far from being artistic, for the simple reason that 2,000 years of civilization have not so far drawn their attention to the

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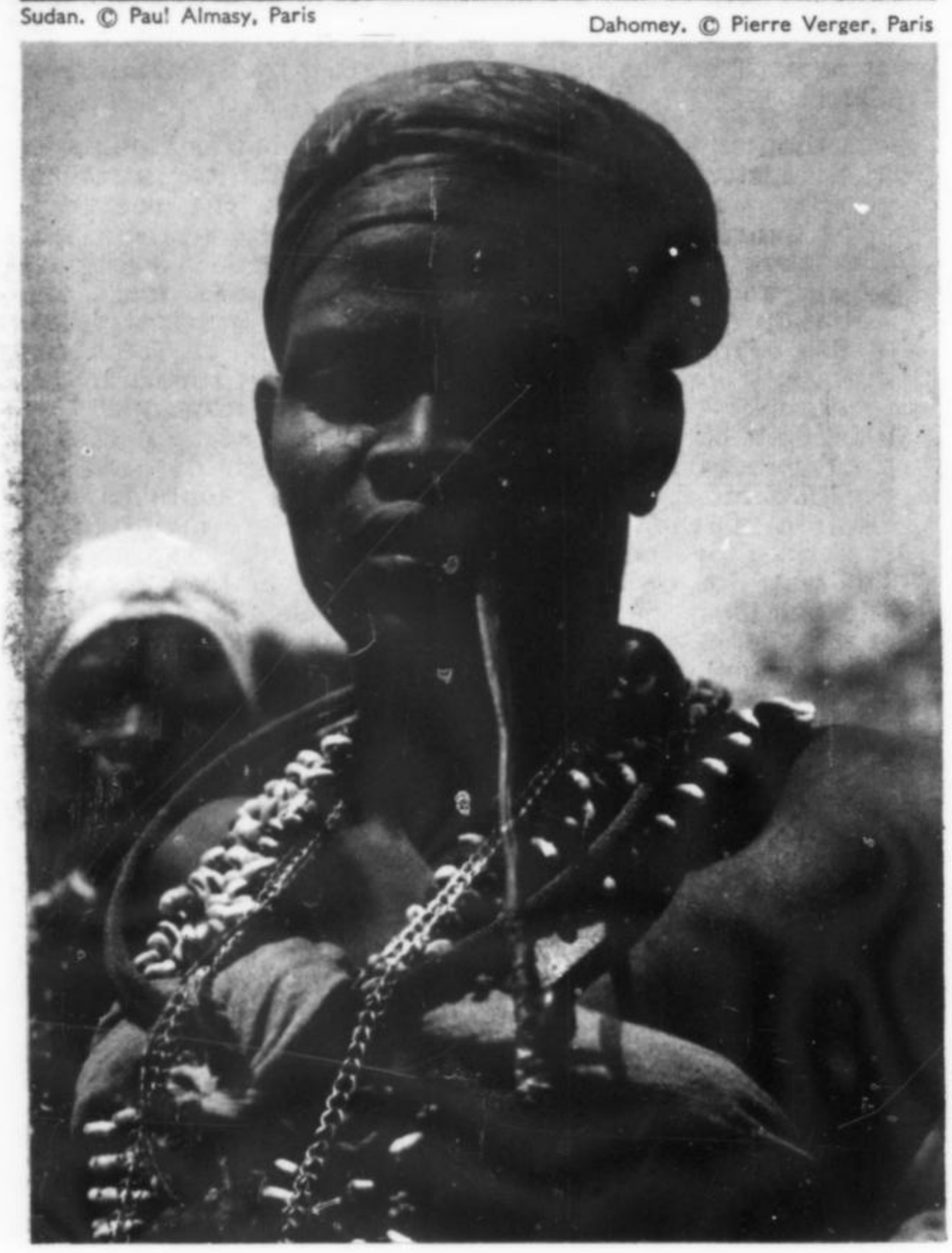
Sudan. © Paul Almasy, Paris



Dahomey. © Pierre Verger, Paris

When a body has the lightness & flexibility of a liana, who could prevent it from dancing?

existence of genuine forms of culture other than their own. One can also remember that some civilizations at thier peak have died out, not having been able to regenerate themselves by contact with external cultural movements. The rôle of African performers of the future must be to bring out the essential, characteristic elements of our cultures while preserving their originality in our contacts with the Western world.

How often do we hear the word "genuine" used at random to describe folklore performances.

Genuine, in fact, compared to what? To a more or less false idea which one has conceived about the sensational primitiveness of Africa? No! Authentic folklore is that which truly represents the more characteristic aspects of the existence it wishes to bring to life on the stage. Thus, to appreciate the degree of authenticity, it is necessary to know at least a little about the life which gave birth to the performance. By giving, *a priori,* a prelogical mentality to the Africans, it is indisputable that one cannot perceive the intense humanity contained in their songs and dances.

For us, anthenticity is synonymous with reality. In so far as folklore is made up of a country's traditions, poems, songs, dances and popular legends, it can only be the reflection of the life of that country. And if this life develops, there is no reason why folklore, which is its living expression, should not develop too. That is the reason why the folklore of present-day Africa is as authentic as that of ancient Africa, both of them being the real expression of the life of our country at two different periods in its history.

What makes folklore authentic?

THE present tendency of an African folklore company such as ours must be to display to the whole world the cultural values of both these two Africas; the traditional and pre-colonial Africa of our forefathers and the Africa of today which is gradually being impregnated with Western civilization. Indeed it would be absurd to confine our folklore only to our own country's past, for no folklore in the world is entirely pure and free of all mixture.

Because Arab influence has indelibly marked Spain, this does not mean that the songs and danges of that country are not genuine. On the other hand the history of the dance teaches us how the liturgical dances of the Middle Ages differed from the popular French dances of the period, during which, through various influences, the latter became the choreographic language of the aristocracy and gave rise to theatre and court ballet, so nearly resembling each other as to be indistinguishable. Have the Basque dances of today remained unchanged in style and meaning for hundreds of years?

In Africa too, just as there are the dances of our fathers and our grandfathers, full of majesty and wisdom, so the younger generations in the villages create today songs and dances which picture our times, already marked by three centuries of colonization.

During our last African tour, a musician of the forest region of Guinea gave us, as a souvenir of his village, some fine "maracas" made of coconuts. Yet it is generally considered that maracas come from South America... There are a hundred similar examples that we could mention for the paradox of a certain type of ignorance is that it considers all objects, instruments, dances and so on, that the black peoples have brought with them in their enforced pilgrimages to other continents, have only become genuine since their exile and because of it.

The essence of authenticity in folklore is not to lose the original character through external influences. In our programme of African ballets we have a "Casamançais"

song, the words of which are in Portuguese Creole, but the feeling of which is deeply African because it expresses one of our oldest proverbs : "Love is like an egg, he who breaks it is lost". In this way a Creole African song may perfectly well find its place in an African performance, Portuguese Creole having become the current dialect of a large part of Casamance to the south of Senegal. In the same way one should not be at all surprised to see half-castes among our performers, singing and dancing in the usual manner of our villages. For if Western influence is felt in the economic, cultural and political life of our country, it is also felt in the field of simple human contacts and has produced the increasingly large class of mulattos, considered by Africa as her own children.

During our last Paris season at the Théâtre des Champs-Elysées, a Press critic seemed to be upset by the fact that our singer Kandia, one of these traditional African "griots", sang in a more or less Spanish-Flamenco style. This journalist was obviously unaware that some African empires from the 12th to the 15th century, had strong ties with the Arab countries and were influenced by them just as Spain came to bear the same Arab stamp. Kandia has no idea what a Flamenco is but, brought up to a knowledge of African history he knows that if the huts in the Sudan (seat of the Mandinga Empire) are rather Arab in style, it is because they have been inspired by the Mosques built by Es Saheli, the architect whom the Emperor Kongo Moussa, brought back with him from his sumptuous pilgrimage to Mecca. And it would be absurd to think that our Sudanese huts were not authentic !

Drums speak with power & magic.

In all countries of the world, art progresses in relation to the social, economic and political conditions which determine it. Thus as well as our pure, unmixed forms of expression we must present those which have been influenced by other civilizations. But whatever the form of expression used, African art teaches us to regard as essential in our societies—solidarity, love of virtue and brotherhood between men.

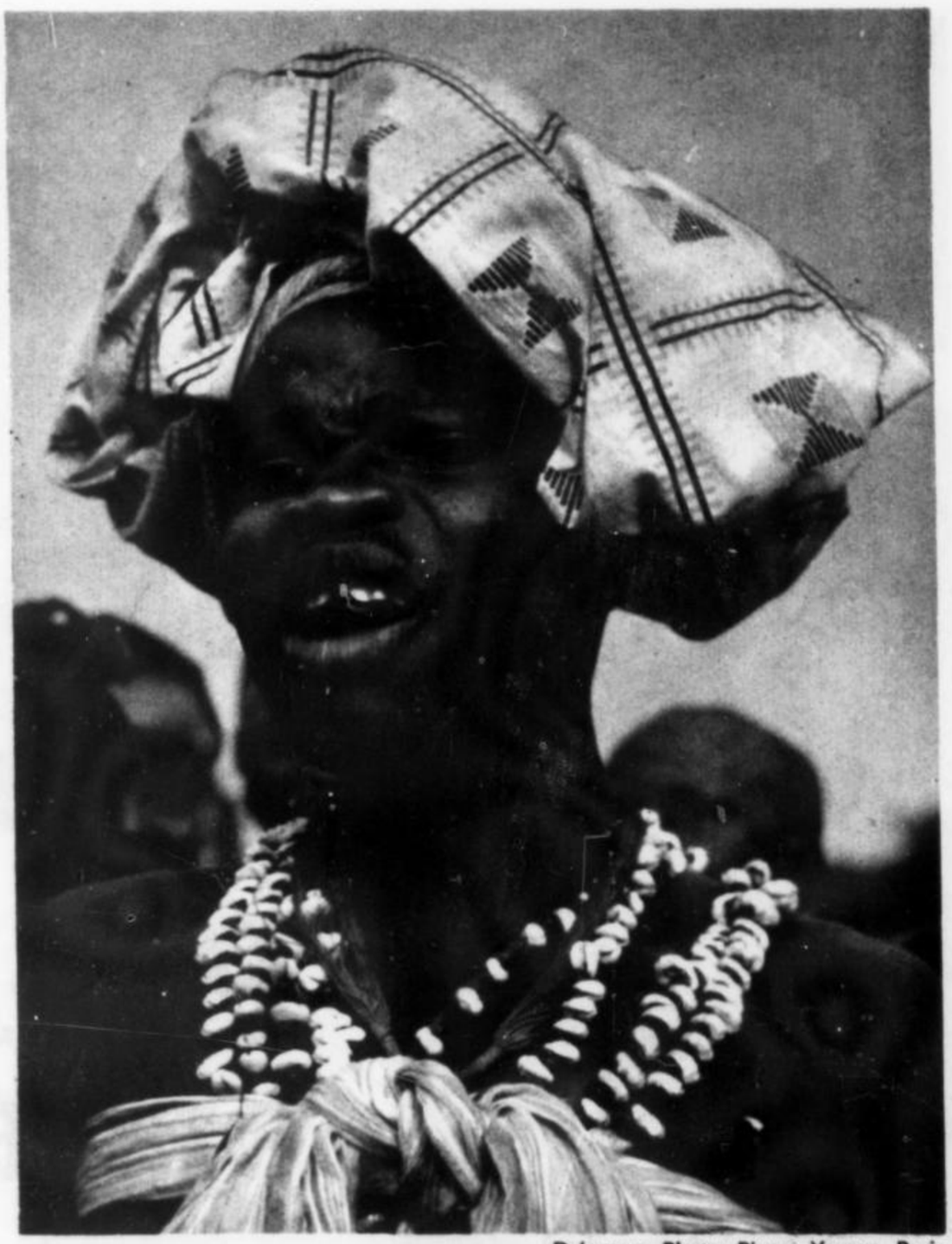
Nevertheless, the stage being different from life, it is necessary to resort to a certain amount of stage adaptation to make ourselves understood by a foreign public. In our African villages, the same dance may last a whole night without tiring anyone. The dances are, moreover, executed in the middle of a ring of spectators who also take part almost as much as the dancers and musicians. On the stage new conditions have to be created through different devices in order to retain the freshness and reality of the dance and to destroy the monotony which is quick to arise due to the non-active participation of the audience. That is the reason why we must take our dances only at their culminating point shorten them and cut out a thousand details which are not important except in the public place of the village.

In conclusion it only remains to express a wish which is dear to our hearts :

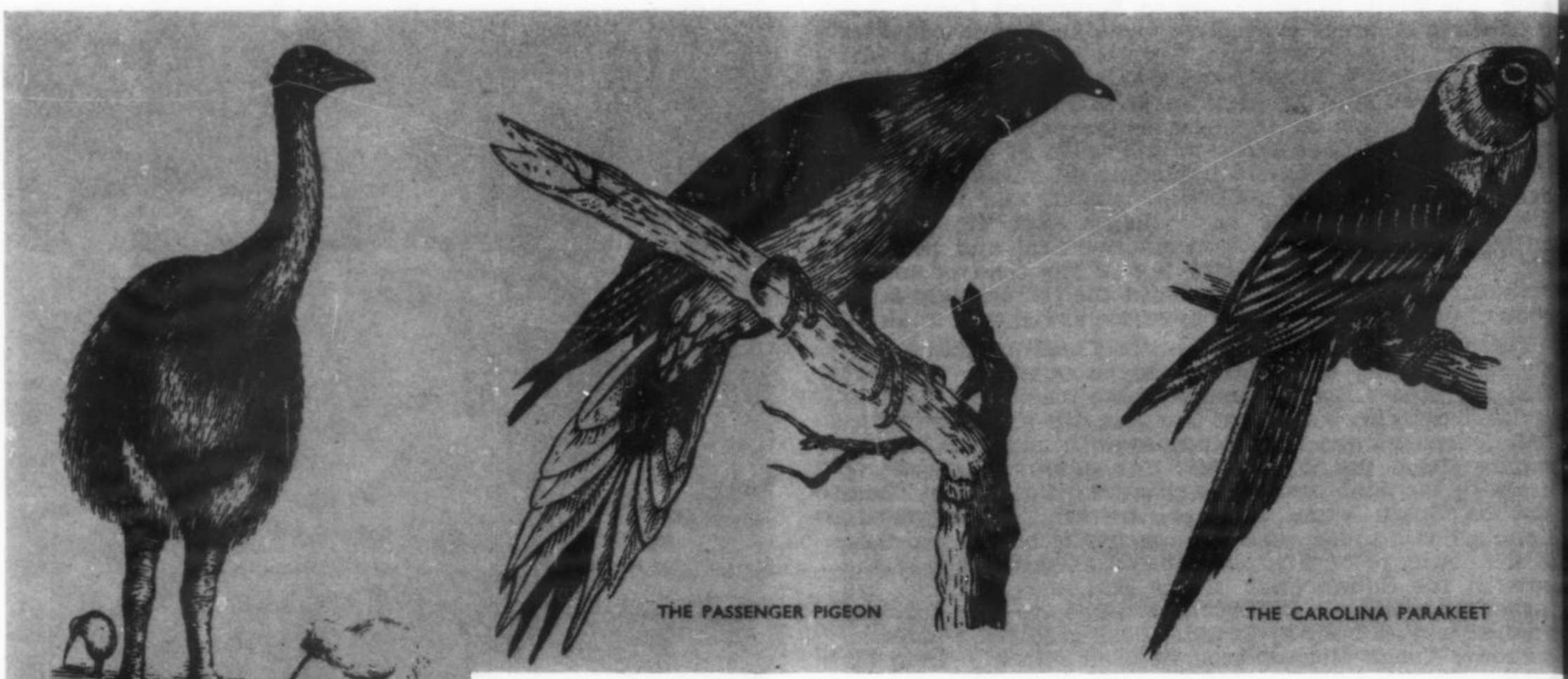
May the Africa of tomorrow never lose the secrets of its songs and dances! May it always be able to dance, for to Africa dance is life—a thousand years having been only like one long dance with many figures, a real dance of life which is the message of Africa today! The Africans in the cities must not neglect this message nor abandon its meaning to the hazards and vicissitudes of history. We do not know to what extent dance may play a determining role in other societies. But we know that with all its moral and social context, dance has been the link which enabled African societies to maintain their cohesiveness. We know that only the drums have sufficent power and magic in their voices to speak to Africans in their original language.

However different the forms and origins of our dances may be, they nevertheless seem to share the same spirit. This is the spirit which man never ceases to discover with wonder in himself. For him there is only one law : continual progress, onwards and upwards. In this way, to the dynamic power of the thought corresponds the dynamic power of the dance, which is thought embodied.

The article above was adapted from "African Dance and the Stage" by Keita Fodeba, published in Volume VII, No. 3 of "World Theatre" (See page 35: "The Only International Theatre Magazine"). Keita Fodeba was born in French Guinea, and after leaving university he became a teacher in Saint-Louis, Senegal. Prior to forming his African Ballet Company in 1950 he travelled throughout Africa to recruit his dancers. He is now Guinea's Minister of the Interior.



Dahomey. Photos Pierre Verger, Paris



THE PASSENGER PIGEON

THE CAROLINA PARAKEET

PHANTOMS OF THE BIRD WORLD

by John Westbury

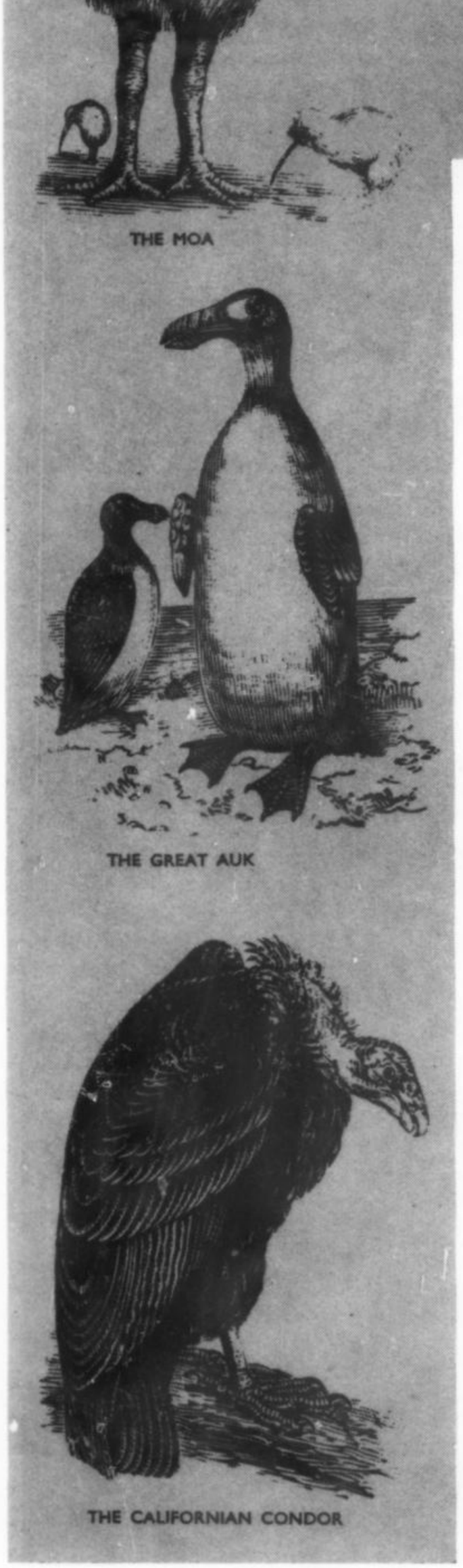
ONE lesson which natural history inevitably teaches the ornithologist and bird-lover is that it is never safe to declare, without some qualifying statement, that a particular bird is extinct simply because it has not been seen in its customary habitat for from 50 to 100 years or so. A case in point is the Californian Condor. For nearly a century ornithologists had considered this bird, one of the "giants" of the air, to be extinct. The reasons behind this supposition were sound enough. The bird, a cliff-dwelling vulture known also as the "Giant Condor", and found mainly in California, had not been observed (at least by knowledgeable people) since the 1850's. Slow to reproduce, and unadaptable by nature to man's encroachment the condor (it seemed) had succombed under conditions which had changed amazingly all within the space of a century or less.

Skeletal remains found near Los Angeles strongly suggested that the Californian Condor had made his home in this part of the world for something like 50,000 years. Possessing great strength, a wing-span ranging from 9 to 11½ feet, and capable of flying as high as 20,000 feet or more, the condor seemed fitted by nature to perpetuate his species for all time, particularly as his life span is in the region of a hundred years. So it was with delight that a report of "a huge, ungainly bird dwelling in the Ventural county" was received by ornithologists a few years ago. An expeditionary party of scientists and game wardens investigated and discovered a number of the birds living in the primitive wilds north of Los Angeles. Over 25 were counted then, but the latest count puts the survivors at over 60, dwelling in a narrow isolated area in the mountains, a region seldom visited by man, which no doubt explains why they had survived unseen.

Until recent years the American ivory-billed woodpecker, second largest in the world, had also been listed in the "believed extinct" list. For centuries it had its main habitat in the Singer Tract country of Louisiana, but lumbermen who laid waste vast areas of the fine virgin forests here also destroyed the homes of this attractive bird. Then it was found in Florida. A secret and guarded 1,000-acre reservation was thereupon marked out to enable the woodpecker to re-establish itself.

Speed saved the notornis

AT the beginning of the present century, New Zealand naturalists began to believe that their notornis, a very rare New Zealand bird, was on the verge of extinction. With the passage of time this belief was slowly turning into "certainty" when, a few years ago, the notornis was rediscovered in the Southland sanctuary. A member of the "rail" family, this green and purple plumaged bird is remarkable in that it cannot fly, though it does possess rudimentary wings. Yet it is able to run at an astonishing speed, a factor which no doubt has contributed to its survival against its many enemies—sparrow hawks, stoats and



THE MOA

THE GREAT AUK

THE CALIFORNIAN CONDOR

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woodhens. It is hoped to breed the bird in captivity to ensure its survival.

The saddleback, which resembles the starling, is another bird which was thought to be extinct in New Zealand. But a few months ago an expedition led by Dr. R.A. Falla, Director of the Dominion Museum in Wellington, rediscovered the saddleback on South Cape Island, a few miles southwest of Stewart Island. It derives its odd name from the chestnut saddle on its back, another oddity being the bright orange wattles below its beak.

When it is clearly established that a certain species of bird has not been seen over a long period of time, it is natural enough for ornithologists to conclude that it has died out, and sadly to add its name to those classical examples of extinct birds—the moa, the dodo, the great auk of the arctic regions, and many others.

The moa, described as an "outsize ostrich" in appearance was in fact a general name given to several species of flightless birds which lived in New Zealand. While the smallest species was about the size of a turkey, the largest was around 12 feet high (i.e. more than twice as tall as the average man), possessing a small head, a long bare neck, short or reduced wings and rounded, loosely-constructed feathers. Though it could not fly, it could run with remarkable speed.

Yet this inherent ability did not save the moa, unless, of course, it still survives in some remote and inaccessible swamp, a possibility which few experts will even consider. To account for its demise, various authorities have put forward theories which are both plausible and interesting. Some anthropologists, for instance, suggest that it was Maori or earlier hunters who wiped out the moa for they were very fond of its flesh. An American expert, studying the basic facts of their disappearance, has recently concluded that the moas gradually dwindled in numbers because they were unable to resist the temptation to feed in dangerous forest swamps that sucked them down to death. This theory is supported by the discovery of the skeletons of moas in the swamplands of the Pyramid Valley in South Island. Others say that various cataclysms of nature—earthquakes, floods, brush fires—were largely responsible.

No scientific doubt exists, however, regarding the fate of the dodo, the pigeon-like bird found only on the Indian Ocean island of Mauritius. The expression "as dead as the dodo," summarizes its fate. When early Portuguese navigators first encountered the bird some centuries ago, they found it was easy prey both for man and dog, and so gave it the name of "dodo", from the Portuguese word for simpleton. For the dodo, three times as large as a turkey, was so clumsily built that it could not fly, run or even fight. Bulky, short of leg, with a long beak and feeble wings, it was no match for the island's settlers or for the domestic animals that were introduced. By the end of the 17th century the dodo was no more than a memory.

Feathers doomed the auk

STILL another flightless bird which nature seemingly forgot to provide with adequate protection against its enemies while on land is the great auk, found in the northern hemisphere near Iceland, in Greenland, northern Canada, and off Newfoundland. Not unlike a penguin in appearance, and about the size of a goose, the great auk was killed off mainly for the sake of its feathers, until it is now said to be extinct.

A similar fate has befallen two much-loved American birds, the beautiful passenger pigeon and the little Carolina parakeet. The former, a long-tailed swift-flying bird, was once numbered in countless billions in the mid-western States. Then came the march of civilization, the destruction of its meeting grounds and the mass capture of the bird for food. In September 1914 the last known passenger pigeon died of old age in the Cincinnati zoo. Similarly, the little Carolina parakeet was unable to reproduce itself quickly enough to counteract its destruction by its enemies.

It is feared, too, that many other attractive birds, among them the Labrador duck, the heath hen, the Eskimo curlew and the Laysan rail, are now extinct or very close to it. Bird-lovers are, however, hoping that the Eskimo curlew may still survive on the Argentine pampas or in the Arctic wilds, for it is a far-ranging migratory bird. But there is little hope for the Laysan rail, a native of several Hawaiian islets. When ornithologists found it the bird was dying out on these islets through lack of vegetation (this was being denuded by rabbits); arrangements were made for surviving birds to be taken to Midway Island. Initially their numbers increased, only to be swiftly decimated by the arrival of rats brought to the islands by ships during the last war.

Yet, ornithologists point to the amazing recoveries made by other birds they had thought extinct, as a sound basis for hoping that some at least of these rare birds may still survive. Before the war the trumpeter swan and the roseate spoonbill were down to a few dozen survivors in their respective habitats. Now they have been found in much greater numbers, the former in the American West and Canada, the latter in Texas and Florida.

There are others, of course, on the "danger" list—the cahow petrel still surviving, if precariously, in Bermuda; the tall whooping crane, an annual count of which at its winter refuge in Texas reveals a steady decline in numbers; the pure wild turkey of the northeastern United States; the flamingo, scarcer than ever in the Bahamas; and the tiny Bachman's warbler, only rarely seen these days in the swampy forests of the southern United States.

While it is true that many species, extinct or threatened with extinction, owe their sad fate to man's tendency to kill them for food, many owe their demise to a changing civilization—new methods of farming, the destruction of virgin forests, wide-scale building and all the other paraphernalia which inevitably follow the changing pattern of man's progress.

'UNESCO MONTH' IN PARIS

PARIS, meeting-ground par excellence of culture and the arts, was the setting last November for a succession of highly successful scientific and artistic events organized by the French National Commission for UNESCO on the occasion of the inauguration of UNESCO's new headquarters and UNESCO's tenth General Conference. The programme, entitled "UNESCO Month" covered a wide range of subjects including concerts, plays, exhibitions and documentary films from many countries.

Probably the most important event of UNESCO Month was a three-day International Round Table in which eight world-famous scientists, five of them Nobel Prize Winners, debated the subject "Man and Scientific and Technical Progress". Held in the great conference hall of the new UNESCO headquarters, the Round Table drew some 2,000 people on each of the three evening sessions and was broadcast and televised to several countries. The Round Table will be given full coverage next month.

UNESCO Month gave special prominence to UNESCO's Major Project on East-West mutual appreciation. While an exhibition of "The Art of Gandhara and Central Asia" was organized at the Musée Guimet with the co-operation of museum curators of Pakistan, Berlin and Rome, another museum in Paris, the Musée Cernuschi, presented an exhibition on artistic exchanges between East and West during the past 5,000 years.

An important part of UNESCO Month were the *Semaines musicales de Paris* (Paris Musical Weeks) during which concerts and musical performances were arranged to complement a series of discussions by noted figures in the world of music on the diversity of musical cultures and particularly the mutual influences of Orient and Occident on musical

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© Agnès Varda, Paris

UNESCO

MUSIC WEEKS. One of the highlights of France's "Unesco Month" was the long-awaited series of concerts of modern and classical composers organized in co-operation with the International Music Council and in which a galaxy of artists of international fame had agreed to participate. Photo above shows Ravi Shankar, one of Asia's most brilliant musicians who played on several occasions, notably in a U.N.Day concert broadcast in a special hookup between New York, Paris and Geneva and also featuring the two violin virtuosos David Oistrakh and Yehudi Menuhin.

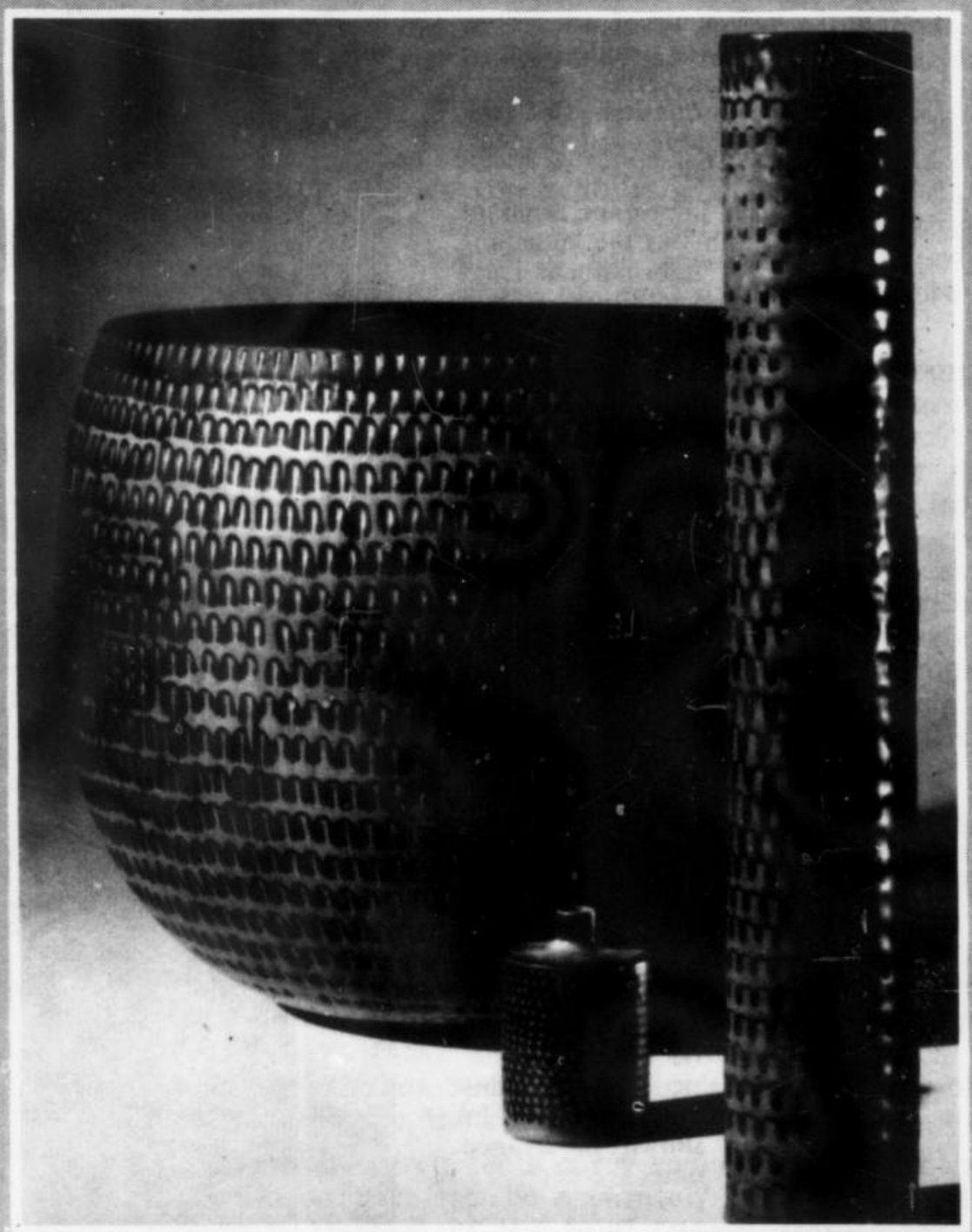
Taken from the film "Le Bourgeois Gentilhomme"

FROM STAGE TO SCREEN

In conjunction with Unesco's General Conference last November, the French National Commission for Unesco arranged an impressive list of cultural events in Paris. France's "Unesco Month" as it was called, included special theatrical performances, concerts, documentary and other film showings from different lands, and various exhibitions dealing with education, science and the arts. In addition to the premiere showing of the film "Le Bourgeois Gentilhomme" (see page 2 and photo left), the Comédie-Française offered a gala performance of Molière's "Fourberies de Scapin," while the Popular National Theatre presented Gérard Philipe and Geneviève Page (far left) in Musset's "Caprices de Marianne."

© Musée Guimet, Paris. From Peshawar Museum, Pakistan

HANDS OF A BUDDHA (above) was one of the many works of art brought together from museums and other collections in Pakistan, Berlin, Rome and Paris to show how broad contacts between the ancient civilizations produced original developments in art. This exhibition "The Art of Gandhara andCentral Asia" illustrated Unesco's Major Project for East-West mutual appreciation.



Hilding Ohlson, Gustavsberg

SCANDINAVIAN FORM. Scandinavia is recognized today as one of the world leaders in interior decoration. The originality and beauty of form and line of Scandinavia's furniture, ceramics, glassware and lamps was the subject of an unusual "Unesco Month" exhibition for which Denmark, Finland, Iceland, Norway and Sweden sent some of the best of their contemporary handicrafts. Photo shows examples of the modern lines of today's Swedish pottery.

'UNESCO MONTH'

(Continued)

development. For the Musical Weeks, Zurich, Rome, Prague, Berlin, Brussels and Vienna sent their most famous orchestras to Paris, while from Asia came two great virtuosos: Ravi Shankar of India and Shinichi Yuise of Japan who performed for the first time together on a Paris stage in a wildly acclaimed performance.

Of the Musical Weeks, Georges Duhamel recently said: "It is with real fervour and hope that I note that UNESCO has announced the creation of the Paris Musical Weeks... If there is one art which can teach people to know one another better, to understand and love their neighbours better, that art is music... Music guides us into the very souls of other men, into the hearts of people of other lands, whereas the ordinary sources of information often tend to distort or colour our judgments of other peoples."

The fourth important event of UNESCO Month was the launching of a series of International Days for Documentary Films. Over 120 documentaries from 32 member states of UNESCO were shown to the public in Paris for the first time. Divided into four chief categories (art films; scientific and technical films; anthropological; and educational films) the documentaries sought to promote interest amongst people who are not regular cinemagoers, and to show the often unsuspected riches contained in documentaries of lesser-known countries.

Other items in the UNESCO Month programme included: an unusual exhibition at the *Institut Pedagogique National* of travel diaries illustrated with sketches, paintings and photographs showing how young French people who have benefitted from French travel fellowships see the world; and an exhibition of 238 water colours, pastels and gouache paintings by the great masters of French art since 1860 assembled from various collections in America and shown in France for the first time.

Musée Cernus

'ORIENT-OCCIDENT, Encounters and Influences Over 50 Centuries of Art," an exhibiti at the Musée Cernuschi in Paris, gave striking testimony to the originality of Eastern a Western cultures as well as to the interaction of their influences. The works displaye ranged from examples of classical times, such as Greek divinities adopted and transformed b the artists of Buddhist countries of East Asia down to modern ones showing how the ex tism of the East has been analysed by Western artists to serve as the basis for new departur in the plastic or graphic arts. Whether dating from neolithic, classical, medieval or mode times, the works assembled at the Musée Cernuschi showed many ways in which t cultural sensibilities of East and West have been brought closer together in greater harmon

Photo, courtesy French National Commission for Unes

PIERRE AND MARIE CURIE whose discovery of radium towards the end of the 19th cen tury did so much to revolutionize theories about the nature of matter and the universe wer honoured in an exhibition held at the Paris Palais de la Découverte. Organized by the Frenc and Polish National Commissions for Unesco (Marie Curie was born in Warsaw in 1867 the exhibition told the story of the life and work of this husband-and-wife scientific team An identical version of the exhibition was also on view in Poland. The Paris exhibitio is to visit other countries. Photo shows Pierre and Marie Curie at their Paris home

An invisible sea around us

THE ENCIRCLING AIR

by Kenneth Johns

OVER and around us flows an encompassing blanket of an invisible atmospheric ocean shielding yet forever moulding the crust of the Earth with its tenuous fingers of gas and vapour.

This aerial shield, with its yearly tides and complex day-to-day movements, is all that stands between us and an environment as harsh as that at the Moon's surface. The air acts as a vast energy-carrier and, with the aid of the great heat reservoir of the oceans, moderates the world's climates. Without this comforting atmospheric overcoat, the temperature could drop to below the temperature of liquid air at night and soar to a baking 110° during the day.

Under these conditions, life would not only be nearly impossible; it is scarcely conceivable that life as we know it could ever have begun.

Yet the presence of air alone would not be enough to make our planet hospitable to life; complex and widespread global airstreams are essential to distribute heat and moisture fairly evenly over the surface. Without the tremendous mass movements of air the Earth would be divided into zones of extremes. The lands would be sterile, rocky continents, seared by unfiltered sunlight during the day—for there could be no clouds, no rain, no rivers to soften the rugged structure of uplifted primeval mountains; there would be no alluvial soil to fill the valleys and no fertile plains to be clothed by the lushness of plant life.

Only in a thin and precarious band around the coasts would moisture diffuse in from the seas to combat the stark glare of the sun. Sunburned deserts would extend across continents on both sides of the Equator, and Tibetan-like tundras, frozen and bleak, would stretch polewards. The frigid seas would push their iceberg probes far nearer the Equator than they now do; the Earth would be a parody of a green and pleasant land.

The circulation of the air prevents this cataclysm, ameliorating conditions over the Earth's surface. At any moment the energy of the air moving across our planet is equivalent to the combined energy of seven million atomic bombs. Yet over a tenth of this energy is lost every day by friction between the winds and the ground. Every upjutting blade of grass and tiny ripple of water takes its toll; a toll that must be constantly replenished from the sun's radiation.

Thousand miles an hour gales

ALTHOUGH there are two million tons of air free for every man, woman and child of the human race, within a little over a week the great cities of Earth would be suffocating under motionless clouds of smoke and exhaust fumes, if the energy lost by friction was not forever being replaced.

In direct contrast to this choking quiescence, if the friction between air and surface was eliminated, winds would rise steadily in strength until rushing, thousand miles an hour gales would be sweeping endlessly around the Earth.

Only the edges of the tremendous air movements brush the lands beneath, where, distorted by local geographical features, they create the meteorological phenomena we recognise as weather. Far above, weaving an intricate three-dimensional pattern across the whole globe, whirl invisible air-torrents and air-falls which in sheer mass far outweigh any surface Niagara. Until quite recently, very few people suspected the existence of such gigantic upper highways.

Yet even the fantastic strength and speed of these jet streams is only one facet of the complexity of the upper air streams.

For two centuries scientific measurement of air conditions near the Earth's surface was used in attempts to forecast the weather, and there was little or no improvement in the old cause-and-effect prognostications handed down in folk-lore from generation to generation.

Breeding ground of the weather

THEN, one hundred years ago, scientists began to look for reasons rather than surface observations in an attempt to understand *why* the weather changed in such apparently haphazard ways. This was the beginning of true weather forecasting. By about the turn of the century meteorologists had a fair insight into the interplay of the tremendous surface forces that, within a few hours, can change the calm of a hot summer's day into a maelstrom of destructive gales. Still, even then, the true breeding ground of the weather—the upper air—was beyond the range of the simplest meteorological instruments.

It was known that air pressure changes accompanied the mass movement of air associated with storms and that there was a rotation effect—yet these inter-related happenings seemed to follow no simple, easily defined track. Sometimes they remained stationary for days and even back-tracked on themselves. As each rotating mass—a cyclone or anticyclone—may be a thousand or more miles across, this meant that there was no way of determining exactly where the moving storms would be twenty-four hours ahead. Even today, this problem is not completely solved and often causes forecasts to be completely inaccurate—as we know only too well in this weather-riddled world.

At first sight, the rotating cyclones and anticyclones tracking across both hemispheres might seem little more than vague local disturbances when compared with the great atmospheric rivers that must be called into being to explain the enormous and never-ending heat transfer from the tropics to higher latitudes. Between the Equator and latitude 38, the Earth receives more heat from the sun than it radiates and reflects back into space, whilst between latitude 38 and the poles the total loss of heat is greater than the radiation received.

Warm ocean currents carry some of the warmth polewards; but this can be accurately measured and is only a small fraction of the total energy transferred. Now, modern theory suggests that cyclones and anticyclones, tiny when compared with the area of the Earth, are the true controlling features of the atmospheric circulation, guiding and acting as energy accumulators for the energy of the prevailing winds.

The major wind systems are impelled into motion by the two overpowering forces of the sun's heat and the earth's rotation. Without the spin of the earth to funnel the

Cont'd on next page

THE ENCIRCLING AIR

(Continued)

winds into their prevailing belts there would be a single great wind system; hot air rising over the Equatorial lands and spreading out high above the earth before chilling and descending over the polar regions.

Even by the beginning of the 1930's, the real nature of the wide-scale circulation of air around the earth was still not known although, earlier, it had been suggested that one of its basic features was the large masses of cold air that sweep down from the poles to bring sub-polar conditions to more temperate climates.

The growing use of aeroplanes boosted meteorology not only by the increased need for continent-wide hour-to-hour forecasts along airline routes, but also as a means of exploring physical changes in the upper air. It was not long before planes were superseded by radio-sondes—balloon-borne miniature meteorological stations drifting upwards and reporting back by radio on the temperature, pressure and humidity of the surrounding air. Tracked, at first visually and later by radar, their movements measured wind speeds at different levels.

And then of course the trouble started. The so-called "classic" theory atmospheric circulation gave a simple but direct picture showing the air being heated near the Equator, expanding and rising many miles into the air. At the same time, dense cold air over the poles dropped and flowed back over the surface—the difference in pressure maintaining a high, slow-moving blanket of air from Equator to poles. Superimposed on this stately turnover were the prevailing easterly and westerly winds due to the spin of the earth.

Unfortunately, this decisive picture just did not coincide with the rapidly mounting collection of upper air measurement.

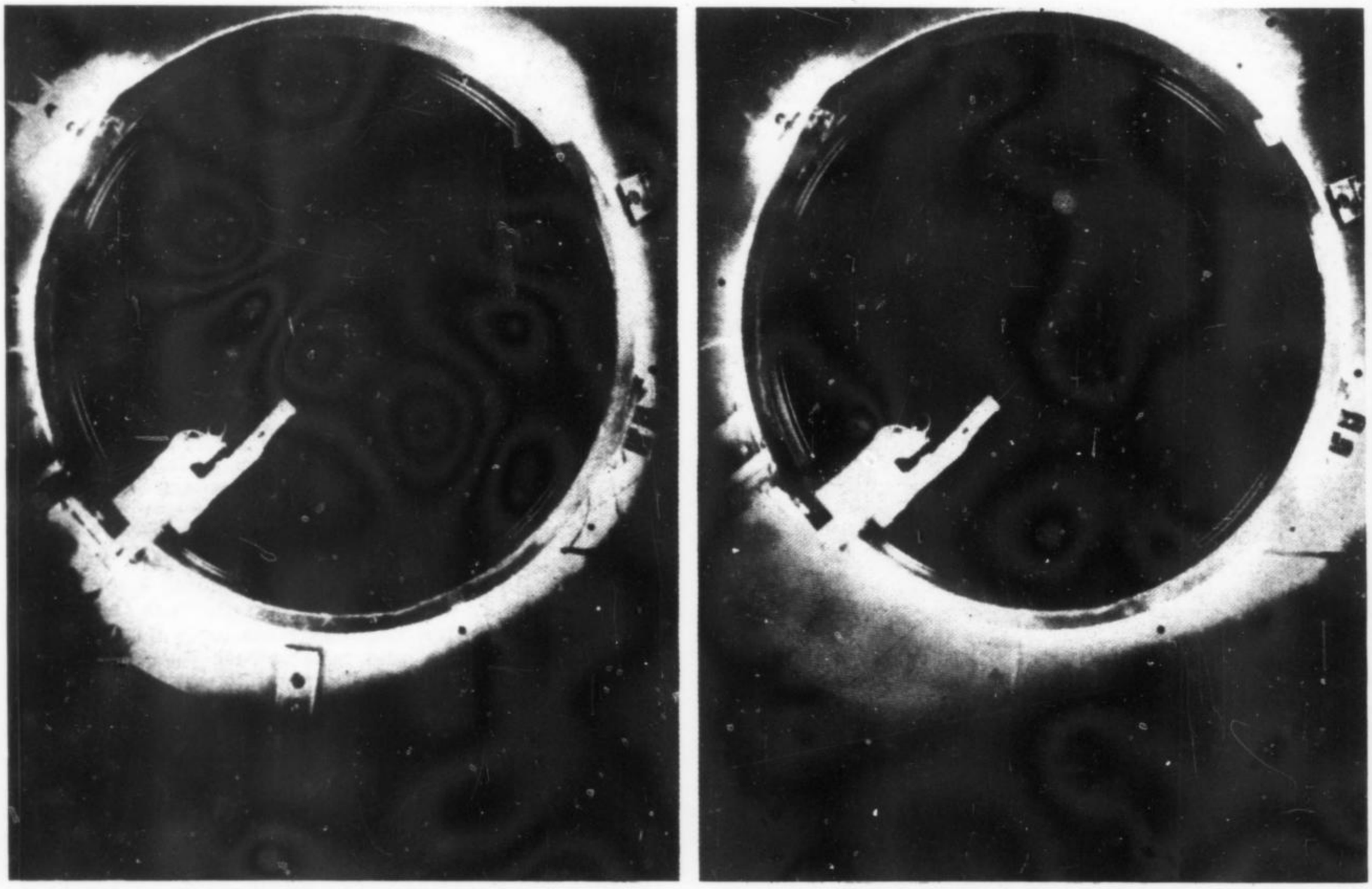
The more data collected, the more of a muddle the upper atmosphere seemed. In it was a chaotic turbulence of upstreams, downstreams, jet streams, west and east streams—all apparently going their own sweet way.

When hot air falls & cold air rises

With the use of high altitude meteorological rockets and increased interest in the no-man's-land between the surface and space, the number of measurements multiplied enormously; slowly, the grand pattern of upper air streams began to emerge.

Instead of their being one huge air cell in each hemisphere, there are three cells.

In the northern hemisphere the cold dry air drops from stratospheric heights over the North pole and pours southwards. Swirled towards the east by the spin of the earth, this blanket extends four or five lobes of cold air to reach down and intermittently sweep over North America, Asia and Europe. As a mass of air stationary with reference to the earth at the North Pole is spinning once every 24 hours in relation to the stars, its spin shows up as it moves southwards, the further south the greater the spin. Outbursts of cold polar air masses can penetrate equatorward up to about latitude 30°. Polar air has its own inner rotation, and if it intrudes far enough toward the Equator it may break away to form a separate



MODEL OF THE ATMOSPHERE. — Within the last decade or so observations, theoretical studies and laboratory experiments all seem to bear out a new conception of our atmosphere as an air ocean set in motion by the sun's heat and broken up by the earth's rotation into a complex pattern of little whirls and big whirls. Though not accepted by all meteorologists the theory has recently been demonstrated in remarkable fashion by small mechanical models, one of which, constructed by Dave Fultz of the University of Chicago, is shown below. Fultz uses a rotating flat-bottomed pan containing about an inch of water to represent the atmosphere of one hemisphere. A few drops

revolving cold mass in the surrounding ocean of warmer air.

In the same way, hot, moist air rises in the tropics and falls earthwards near latitude 30. This too gives rise to spinning masses of warm air and these may move northwards into the cooler air, slowly losing their spin.

Both these systems of bubbles—hot air in a greater mass of cool air and cold air in warm—represent a transfer of potential energy that is transformed into moving energy as each rotating bubble gradually loses its identity.

The cold air masses are cyclones. The rotating hot air masses are anti-cyclones. Each acts as a means of converting heat into kinetic energy, the power behind the winds. Where there is a high pressure area, as at the centre of an anti-cyclone, there is in effect a hill of air pushing the earth's atmosphere further out into space; a low pressure area represents a trough. With their rotation, the effect is of a series of airwaves sweeping around the earth carrying life-giving rain to the centres of continents.

Outbursts of cold and warm air assume wavelike configurations in the middle latitudes. The position and movement of these waves may be forecast, giving an idea of weather trends on a global scale. This method cannot, however, be used for regional forecasts where so many surface factors have to be taken into account. The northern hemisphere's surface air circulation is entirely different at sea level, the prevailing winds north of latitude 60 being easterlies—diametrically opposite to conditions existing higher.

Between the polar and tropical air cells, between Cairo and Paris, lies a region where the vertical air flow is reversed; hot air falls and cold air rises.

This is not a flagrant reversal of the laws of gravity and thermodynamics. Energy is supplied to this intermediate air cell by the other two cells and by cyclones and anti-cyclones. And with immense energy, almost anything is possible, including defiance of gravity.

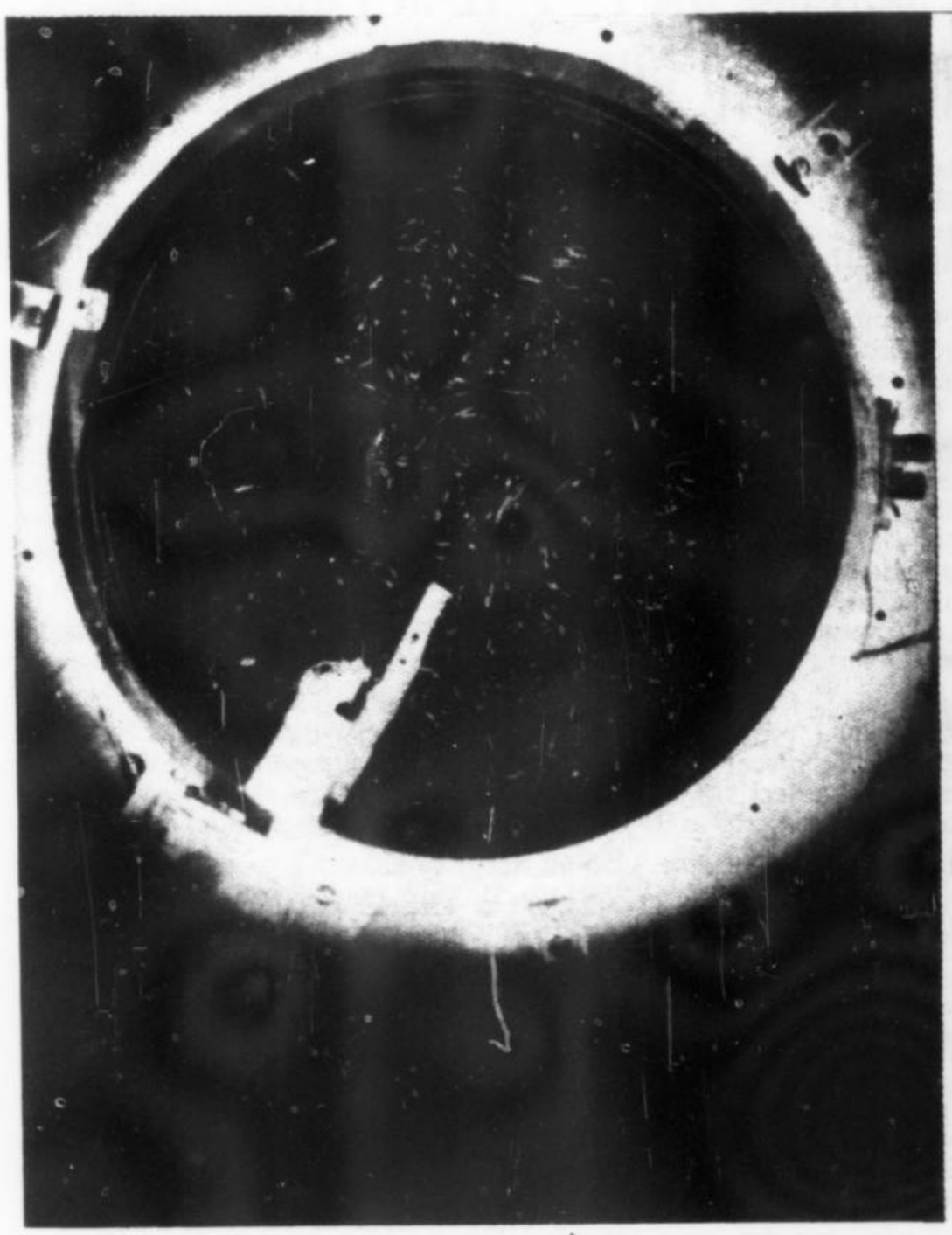
Weather 'spies' in outer space

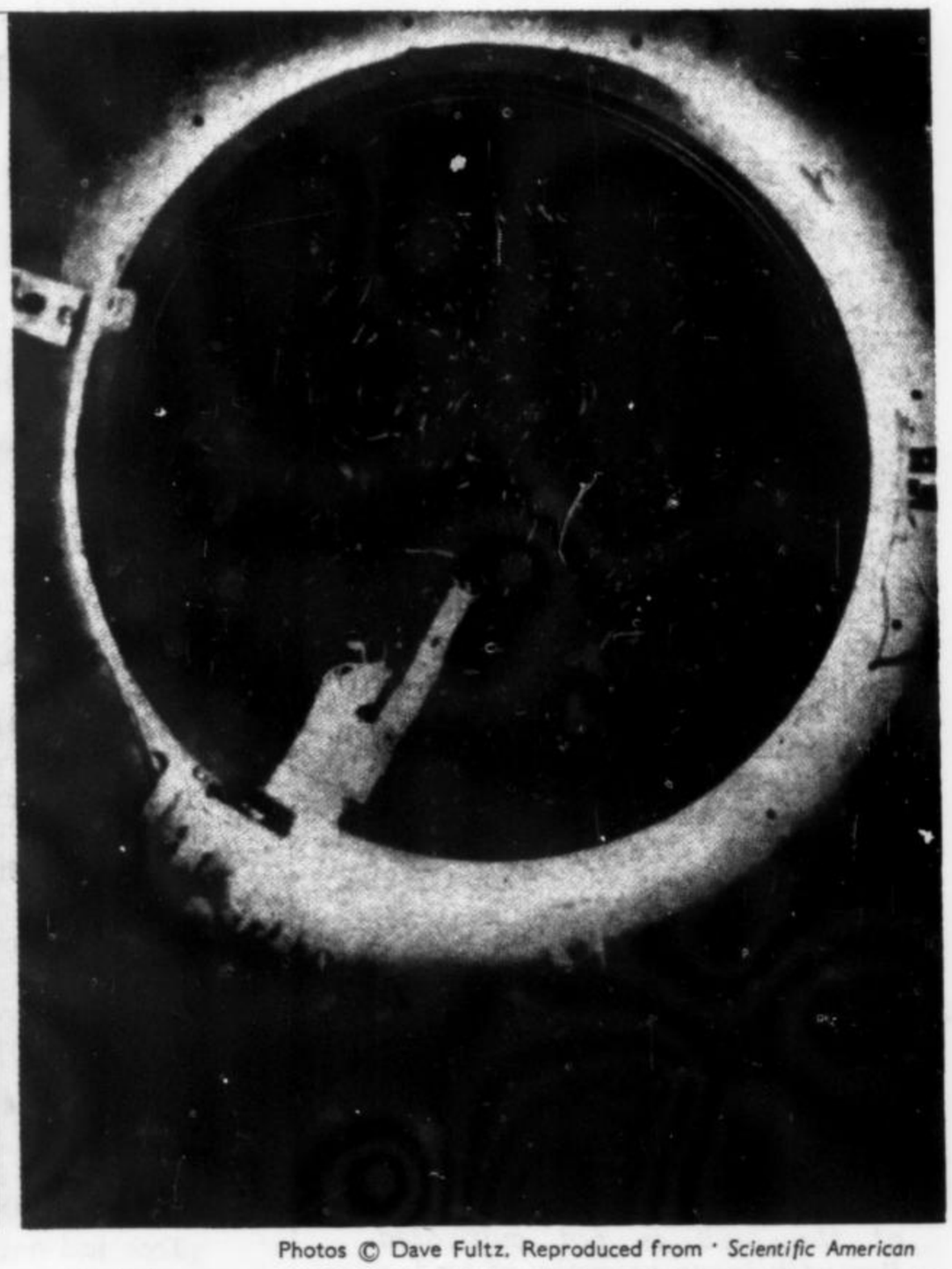
WHILST this picture is contrary to older ideas, its essential correctness has been demonstrated by a fair amount of experimental work. Dye dropped into a slowly spinning pan of water warmed at the rim gives a remarkable two-dimensional pattern closely analogous to the pressure patterns in the earth's atmosphere. Agreeing both qualitatively and quantitatively with the equations involving rate of spin and temperature differences, the model even reproduces the eddies of air near the base of the atmosphere and the fast moving jet streams near the top. (See photos below.)

Our knowledge of the movements of the earth's atmosphere will be enormously broadened when data from the International Geophysical Year is analyzed and we have a flow of information from artificial satellites *outside* the earth's confusing covering of air to add to our standard internal measurements.

Perhaps the meteorologists will then know more about the effects of the millions of tons of carbon dioxide pouring into the air from chimneys, more of the long-term weather effects of nuclear contamination, more about the causes of the ice ages and the two-to-ten-year drought extending over half the United States.

Perhaps they will even be more sure of tomorrow's weather.





Photos © Dave Fultz. Reproduced from · *Scientific American*

of dye render the patterns of flow in the water visible. The pan is heated at the periphery (the "equator") and cooled in the centre (the "pole"). Slow rotation gives a simple pattern of circulation (two photos left), with accelerated rotation it breaks up into a pattern of eddies resembling cyclones and anti-cyclones of a weather map (two photos right). From the periphery and the centre eddies move toward the middle "latitudes" in the pan. "Westerly" currents appear in this zone, and "easterlies" come into being near the edge (the "equator"). The model even reproduces, the vertical variations in our atmosphere: at the bottom, separate eddies; higher up, fast-moving airstreams.

From the Unesco Newsroom...

NEW SCHOOL OF THE AIR: Australia is to have a new "school of the air" which will broadcast special radio lessons to correspondence pupils of the South Australian Education Department who live on remote sheep and cattle stations north of Port Augusta. The new school will make use of the two-way wireless equipment as in the case of other Australian "schools of the air".

■ **WINNING THE OPIUM BATTLE:** *Successes are reported in the battle being waged against opium in Iran where the growing of the poppy and the smoking of opium were prohibited in* 1955. *A recent report on the campaign by Dr. William Ossenfort of the World Health Organization shows that the number of addicts being treated daily in Teheran has dropped from* 800 *to less than* 30. *The effect of controlling the smuggling of opium from neighbouring countries has been to send the price of the drug to* 40 *times what it was before prohibition.*

STATESMAN'S UNESCO POST: Harold E. Stassen, who until recently held the post of special assistant on disarmament to the President of the United States, has accepted a UNESCO appointment as special consultant to the Turkish Government to help in the development of the Middle East Technical University, opened last year. Mr Stassen is first going to Ankara where the Middle East Technical University is located. Schools of administration, architecture and engineering are already in operation there. Mr Stassen will assist in the development of other schools, including a school of agriculture, and will co-ordinate the university's programme so as to fill the urgent need for engineers, scientists and technicians.

■ **LIFESTREAMS FOR A VALLEY:** *Climatic conditions in the Ararat Valley near the Turkish border of the Soviet Republic of Armenia make it possible to harvest two and even three crops of certain types annually. Due to lack of water, however, nearly one third of the land is not cultivated. Recently large reserves of underground water and numerous springs have been discovered in the area and Soviet scientists are planning a system of canals and pumping stations which will help to reduce water consumption from nearby lake Sevan and turn marshes into cultivable land.*

TOURISM THROUGH TV: Last year televiewers across the U.S.A. from San Francisco to Pittsburgh made the acquaintance of peasants in the Pyrenees, joined Parisians in their everyday activities and visited the World Fair in Brussels. This "tourism through TV" was a project carried out by three American TV specialists who came to France and filmed a series of feature programmes and documentaries. The aim of the programmes was to improve international understanding, and many of them were designed specially for children because, as the producers put it, "children are still free from prejudice and pre-conceived ideas". The success of the experiment has shown that it could well be tried out in other countries.

■ **SAVED BY WEATHER SHIPS:** *The lives of thirty-four people were saved in* 1957 *by weather ships stationed in the International Civil Aviation Organization's North Atlantic ocean network. The network consists of nine stations manned by vessels which supply weather reports for use in meteorological forecasting, search and rescue services, and navigational aid to aircraft flying between Europe and America. The ships' search and rescue facilities, however, are mostly used by surface vessels: none of the* 34 *persons rescued in* 1957 *were on board scheduled civil aircraft.*

UNESCO EMBARKS ON TWO-YEAR PROGRAMME WITH LARGEST-EVER BUDGET OF $26 MILLION

IN 1959 UNESCO is beginning a two-year programme with the highest budget —nearly $26 million—in its 12-year history and a mandate from its 81 Member States to concentrate its resources on priority needs in education, science and culture. The mandate was given and the budget and programme approved at UNESCO's Tenth General Conference during whose month-long session—from November 5 to December 5—the new UNESCO Headquarters in Paris was inaugurated and a new Director-General, Dr. Vittorino Veronese of Italy was appointed to succeed Dr. Luther H. Evans of the United States. (See November and December issues of THE UNESCO COURIER).

Foremost among the examples of concentration in UNESCO's Programme are the three "major projects" first approved two years ago by the General Conference in New Delhi. These projects aim at expanding primary education in Latin America, bringing scientific research to the aid of the arid lands in the dry belt running from North Africa through the Middle East to South Asia and promoting mutual appreciation of the cultural values of Orient and Occident. (See THE UNESCO COURIER, December 1958). The Conference voted a total of $2,310,000 for these three projects during the next two years.

Out of the total budget of $26 million the highest expenditure is for education: $3,871,000 for the regular programme of the education department. When the sums provided by the Technical Assistance Programme and those destined for the primary education project in Latin America are added to this the total reserved for educational projects in 1959/60 is more than $8½ million.

Some other highlights of UNESCO's 1959-60 Programme are:

Awards of fellowships totalling $1,247,000 to artists, writers, musicians, teachers of journalism, etc.

Aid to Member States in setting up a regional mathematics centre in Latin America; the creation of libraries in Africa; aid to research in nuclear physics, the marine sciences and electronic "brains"; assistance in the preservation of works of art.

International conferences on primary education in Africa, adult education, electronic computation (over 1,000 specialists are expected to attend a meeting on the subject in Paris this year); the biological effects of ionizing radiations and the professional training of journalists.

Technical assistance given by some 300 specialists working in more than 50 countries.

Aid to under-developed countries to develop their mass communication services ($600,000 available).

FAO OFFICE FOR AFRICA: The capital of Ghana, Accra, will be headquarters of the new African regional office of the U.N. Food and Agriculture Organization. Its creation was decided by an FAO Conference in 1957. The next session of the Conference will discuss the proposal to create two regional sub-offices in the north and south of the African continent.

■ **RESEARCH GOES TO SCHOOL:** *An effort to help bridge the ever-widening gap between the worlds of research and the schools is now being made in Great Britain through a new publication, "Educational Research: A Review for Teachers and all concerned with Progress in Education". This publication aims to provide comprehensive and authoritative statements of the main facts and conclusions derived from research and thus provide teachers with the basis on which to take practical decisions. Articles in the first issue include: "A New Look at Intelligence Testing", "The Wish to Learn-Research into Motivation" and "The Relative Effectiveness of Different Methods of Teaching Reading". The review prepared by the National Foundation for Educational Research in England and Wales, can be obtained from Newnes Educational Publishing Company, Tower House, Southampton St., London W. C. 2., price 5/6 per issue or annual subscription (three issues) 16/6.*

TEN YEARS OF UNESCO COUPONS
Cutting red tape to promote education, science & culture

TEN years ago last month, the purchase of a $2.50 book started what is today a multi-million dollar international business controlled by 81 countries. These countries are Member States of UNESCO which in 1948 launched the UNESCO Coupon Scheme to help cut the red tape of currency exchange restrictions in certain fields of foreign trade.

At that time books and periodicals had to take their place in the long queue of applications for a share of foreign currency available. In many countries that total was—and still is—very limited and the needs of students, librarians and scientists had to compete with other demands—from foodstuffs to machinery and raw materials.

A partial clearance of this discouraging complex of red tape and dead ends was started in December 1948 when UNESCO put into circulation special coupons which institutions and individuals could buy in their own currencies and then use to pay for foreign publications on educational, scientific and cultural subjects.

Since then governments of 22 of UNESCO's Member States have agreed to the distribution of UNESCO Coupons for which they pay the Organization in dollars, French francs, pounds sterling or other monies which UNESCO can use in carrying out its work. Designated distributing bodies then sell the coupons for local currencies.

In 1950 UNESCO Coupons became valid for the purchase of educational films and scientific materials as well, and four years later the scheme was extended to include educational and cultural travel. More than 4,000 suppliers in some 30 countries now accept UNESCO Coupons. (Coupons can be used to subscribe to THE UNESCO COURIER). Up to September 1958 UNESCO had issued $23,475,000 worth of UNESCO Coupons.

Whether used for buying a pocket dictionary or a Geiger counter, a film on mathematics or a foreign study tour, UNESCO Coupons are giving practical assistance to the development of education, science and culture around the world.

FOOD FOR SPACE JOURNEYS: Scientists of Leningrad University's Botanical Institute state that microscopic water plants, algae, are likely to provide an ideal food for the future traveller in outer space. Experiments being conducted by the Institute show that some forms of algae contain more vitamins than lemons, and others can produce more fats than many varieties of oil-bearing seeds.

■ **TOP FISHING COUNTRY:** *Japan not only continued to be the world's foremost fishing country in* 1957 *but actually increased its lead. In* 1957, *Japanese fishermen brought home* 5,399,000 *metric tons of fish or* 18 *per cent of the total world catch. The U.S.A. was second with a little over half Japan's total. These figures are given by FAO's "Yearbook of Fishery Statistics" which records that seven countries—Japan, U.S.A., China (mainland) U.S.S.R., Norway, India and the U.K.— caught more than one million tons of fish in* 1957.

HISTORY IN A SNOW PIT: By digging a 50 feet deep pit in the snow at the Amundsen-Scott South Pole Station, members of a U.S. team working there, were able to reconstruct a picture of past climatic conditions of the region. The snow they excavated was melted for their water supply. It was so hard that it had to be chipped loose with axes and hauled to the surface. By studying its stratification and examining snow crystals scientists were able to learn much about the history of the Antarctic. Traces of ash, for instance, may reveal that a volcanic eruption took place at a certain period and deposits of pollen may provide a clue to past wind systems.

■ **ASIAN STUDY KITS:** *As part of a programme to encourage the study of Asian countries in United States schools, the Asia Society in New York has assembled an experimental packet of teaching materials designed to supplement textbooks and other sources. Each kit includes* 17 *photographs of representative Hindu, Buddhist and Mogul art and architecture, a series of "people and places" pictures with captions and pamphlets, reference lists, maps and other audio-visual materials.*

'SUNRISE SEMESTER'S' BIG SUCCESS: The early morning T.V. course for university students called "Sunrise Semester", started last year by New York University, has broadened the scope of its programmes for the present school year. Last year it began as a university course en comparative literature and although only 117 students registered for the course at the University, some 120,000 viewers followed the programmes each morning from 6.30 to 7.30. This year four different courses will be offered, and the possibility of an eventual full four-year college programme on television is being studied.

■ **UNESCO H.Q. ARTISTS WIN MAJOR AWARDS:** *Three artists whose works decorate the main piazza of* UNESCO's *Headquarters— Joan Miro, Alexander Calder and Henry Moore— are winners of the three major international art awards announced since the new* UNESCO *headquarters was completed last year. In November Miro was named the* 1958 *winner of the Guggenheim International Art Award for his two ceramic wall designs which stand near* UNESCO'S *Conference Building. Recently the Carnegie Institute named Alexander Calder, whose giant mobile stands at the entrance to the Conference Building, as winner of its first prize for sculpture and Henry Moore, whose massive "Reclining Figure" is placed before the* UNESCO *Secretariat Building, as winner of the second prize for sculpture.*

Letters to the Editor

MAN'S DEBT TO THE WHEEL

Sir,

The wheel (wheel and axle) is one of the six simple machines, the others being the lever, pulley, inclined plane, wedge and screw. Of these the wheel has been said to be the most significant invention of man. Certainly it is the wheel that has played a disproportionate part in the development of man as compared with the others. Transportation without the wheel is, to us, utterly inconceivable. Without it we should still be paddling down a stream, climbing a mountain on foot, riding a horse to distant points or crossing a desert on a camel. With the vastly enlarged and expanded means of transportation afforded by the wheel came a proportionate increase in trade and commerce... the contact of peoples one with another and... the spread of knowledge which lead to further development of mechanical means. The wheel has a very long history in its own right... Would not THE UNESCO COURIER do well to devote an entire issue to the subject?

H. T. McClure
New Albany, Ind., U.S.A

BIBLE TOPS TRANSLATIONS

Sir,

Readers of THE UNESCO COURIER will perhaps have been surprised to see, in the issue of April 1958, that the Bible—so often claimed to be the book translated into the greatest number of languages—only took sixth place in the statistics of published translations, on the basis of documentation supplied by *Index Translationum*. Examination of the sources of information on which these statistics are based enables one to see that simply to add up the translations mentioned in the various national lists can lead to an erroneous interpretation of the real situation.

Apart from four countries, the publications of the Bible Societies have been completely overlooked, even in countries like Great Britain and the United States of America, where Scriptures are published each year in numerous languages.

Moreover, in the case of any author, each publication of any of his works in translation, whether book or pamphlet, counts as a unit in the lists of Index Translationum. In the case of Lenin, for example, who comes at the head of the table brought to our attention for 1956, the figure of 331 does not mean that the works of Lenin in whole or in part were translated and published in 331 different languages during 1956, but simply that in 1956 there were 331 editions of works of Lenin published (whether whole books or pamphlets) as either first editions or reprints, the number of different languages in which they appeared not being taken into account. According to the same lists of Index Translationum, the number of languages in which translations of works of Lenin were published that year was only 14. In the same year the whole Bible was published in about 60 languages and New Testaments or portions of the Bible in a further 110 languages. We have therefore no reason to doubt that this figure for the Bible remains the highest ever attained by any book, as far as the number of languages in which a work has appeared is concerned.

Olivier Beguin
General Secretary
United Bible Societies, London

UNBIASED & NON-POLITICAL

Sir,

In my opinion THE UNESCO COURIER is one of the greatest publications of our age. It possesses three virtues that I cannot find in any other magazine. Its views and news are unbiased, it is non-political and it refuses to grind the axe of nationalism. If only the world press would drag itself from the morass of sensationalism, party politics and vested interests, and present the news to the world in UNESCO fashion—then I feel that fear and war would vanish practically overnight.

I was glad to see a copy of THE UNESCO COURIER in the Childrens' Library of this town the other day. Some adults will never accept the broad principles of universal friendship but at least our children can help rectify our mistakes by realising through your magazine, that the chap in the next country is not so bad after all.

R. Robertson
Launceston, Tasmania

'MAN AGAINST HIMSELF'

Sir,

Let me tell you that I tremendously enjoyed (if enjoy is the word) your "Man Against Nature" (January 1958) issue. It is one of your best and most important efforts.

If I may make a suggestion, as a reader getting into his fourth "Courier" year, it is this: let us have another, as vital and more pressingly urgent issue—"Man Against Himself." Let us start it with a report on workings and findings of the permanent investigation carried out on the Hiroshima survivors. A recent reader's letter from California suggested an issue on fallout, and my suggestion is—luckily!—not original. I keenly appreciate your dread of anything that smacks of politics—you just have to avoid any slammed doors. Still, a lot can be done to explain and draw attention to the meaning of modern war—without getting into political hot water. "Man Against Himself" like "Man Against Nature", will be fully in line with Unesco's 'E' for Education. For further items on such an issue, we could have: Summary of WHO's report on dangers of radio-activity; other dangers to our environment such as air pollution (Smoke-fog, combustion-gases), water pollution, noise. I am certain it would present no difficulty to fill an issue.

Let me finally congratulate you on the good work your monthly is doing. I sometimes wonder if more publicity could not be given to it; there still remain many potential readers who simply do not know what THE UNESCO COURIER is like. I will confess I used to be disappointed by a certain naiveté in some of your earlier issues—but of late your grip has become quite sure, so I certainly remain, your loyal reader.

W. J. Ehrenberg
Wettingen (AG), Switzerland

Ed. Note: An issue on this subject is now being planned for 1959.

ENGLISH WITHOUT TEARS

Sir,

As a teacher I am very interested in reading how many countries overcame the problem of illiteracy. I have found THE UNESCO COURIER, to which I am a subscriber, to be the best source of such information. In the July 1958 issue, a letter asked for information relating to certain youthful problems. My colleagues and I are faced with a similar problem.

Our pupils whose average age is 18 come here for a vocational training in various trades for a period of ten months. My colleagues and I, as teachers of English, are concerned with making them acquire a suitable working knowledge of English. We take each class for ten hours a week in winter and for six hours a week in summer. On entering the Centre the standard of education of the majority of the pupils is somewhat below the Primary School standard.

We will be very grateful for and receive with appreciation, information about how other countries overcame such problems, and suitable literature and advice concerning an interesting and effective way of teaching English to our pupils.

Joseph L. Mallia
Government Industrial Training Centre
Marsa, Malta

HE SEEKS SUBSCRIBERS

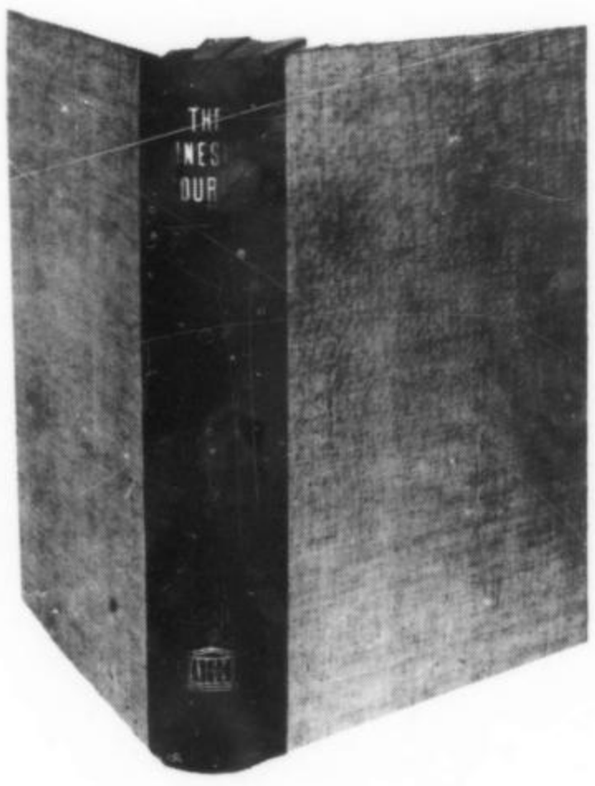
Sir,

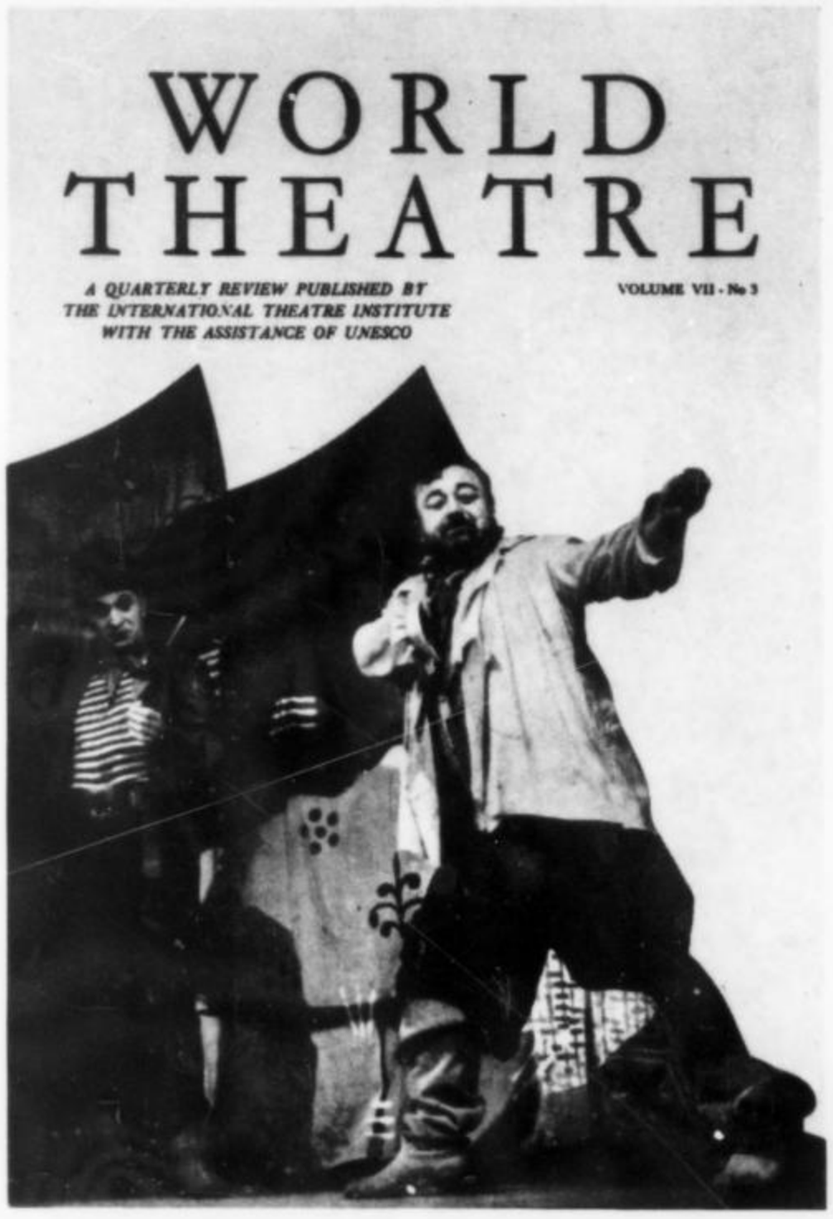
I have always been thinking of writing you a letter, in order to thank you and congratulate you on producing such an educative and informative magazine. And, as a token of gratitude, I have been introducing your magazine to my friends and to those with whom I make new contacts, and, I am very happy to say that, as such, I secure for you new subscribers.

M. E. Kitabwalla
Mombasa, Kenya

BINDERS FOR YOUR COLLECTION OF *Unesco Courier*

We offer subscribers a special binder for their copies of THE UNESCO COURIER holding 12 issues of the magazine. Handsomely produced in halfcloth with the spine in an attractive blue and the title (in English, French or Spanish according to the edition to which you subscribe) and Unesco colophon embossed in gold, these convenient and attractive binders, costing $2.50; 12/6 stg.; or 600 Fr. frs, can be ordered from UNESCO Agents, below.





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For authoritative and comprehensive comment on all important theatrical productions throughout the world, from Tokyo to Broadway, from London's West End to Moscow and from Paris to Belgrade, THE UNESCO COURIER recommends "World Theatre", a quarterly bilingual (English and French) review published by the International Theatre Institute (I.T.I.) with the assistance of UNESCO.

The only international theatre magazine, "World Theatre" has been published since 1950 and contains special articles on subjects of international importance and theatre news from each of the thirty-six member countries of the I.T.I. Issues have been devoted to special subjects such as Theatre Architecture, New Playwrights, Theatre and Youth, The Audience and The Theatre of the Nations.

Attractively and copiously illustrated, "World Theatre" is published for the I.T.I. by Elsevier, Royal Building, 55 rue Royale, Brussels, Belgium. Annual subscription: $3.50; 25/-(stg.); 1,050 Fr. frs. Available in local currencies through Unesco Sales Agents (below).

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The dance plays a profound role in the life of the people of Africa. How profound and important this role is cannot however be understood fully by isolating it from the everyday life of the people. Thus when a country's economy is essentially agricultural and involves few needs and material worries why not move like a bird, crawl like a snake or open like a flower to be in communion with Nature and the mysterious forces which people and animate it? This is one of a number of questions raised by Keita Fodeba, creator of the African Ballet Company, in an article on the authenticity of the African dance appearing on page 18. Here French Sudanese villagers are dressed up for a bird-dance.